ELECTRICAL SOUTH

Serving the 18 Southern and Southwestern States

Norfolk contractor's experience proves adequate wiring can be sold—page 18

AUGUST, 1954

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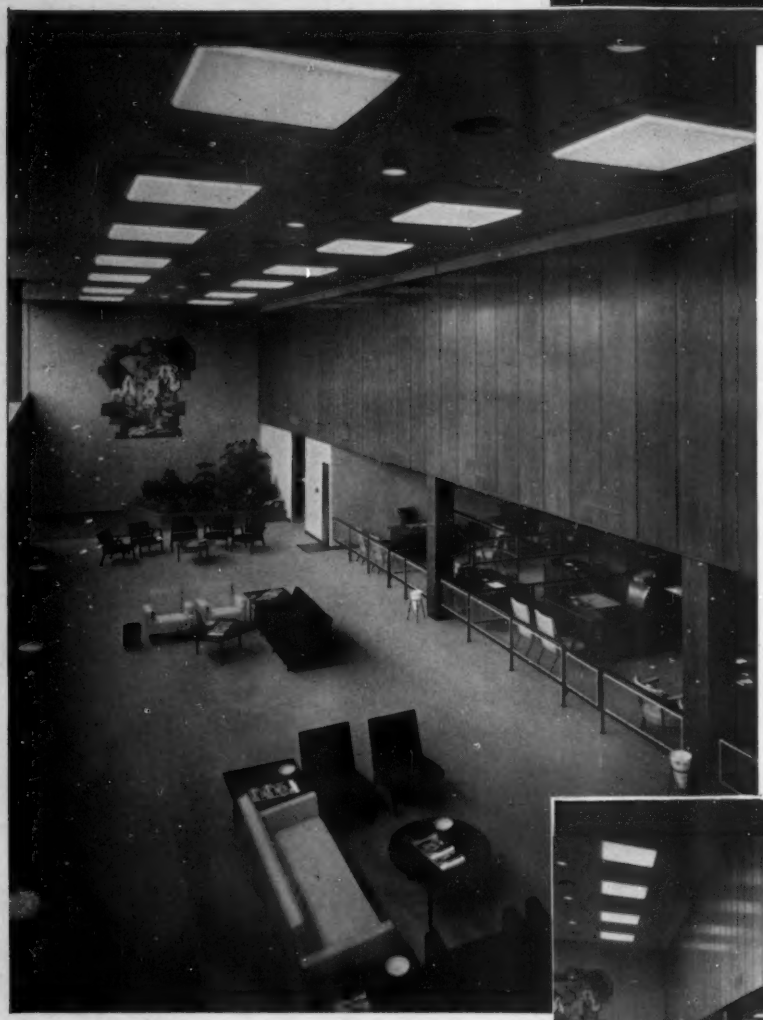

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Volume 34 Number 8

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SERVING THE 18 SOUTHERN AND SOUTHWESTERN STATES

August, 1954 — Vol. 34—No. 8

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TO HELP THE BUSY READER—

Here is a **contractor who insists on quality wiring,** or he won't do the job. **(Page 18.)** In this time when so many electrical contractors are urging home builders to lower their wiring requirements so that lower bids can be submitted, it is encouraging to find this Norfolk, Virginia firm which is building its reputation by insisting on installing wiring well above adequate wiring standards.

A Texas contractor attributes much of his success to his new **two-way radio system.** Although the cost was substantial, the system has completely paid for itself in a short time. Read his story on **page 22.**

The National Electrical Code has many provisions which lend themselves to the arrangement of wiring systems to meet the constantly increasing use of electricity. John M. Turnbull, of the Western Massachusetts Electric Co., recently told the NAED convention **how the Code provides for wiring modernization.** His remarks will be found on **page 28.**

A maintenance electrician in one of the South's large textile mills tells how his plant is meeting the **problems of maintaining motors, switches, starters, and loose connections.** His discussion will be found on **page 30.**

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Economic comment

by J. Whitney Bunting, Ph.D.

Southern agricultural prospects

◆ TOO FEW BUSINESSMEN realize the great impact that farming returns have on their economic well-being. This is particularly true in the Southland, where many sales of merchandise and other wares are dependent upon farm markets. To this end, any form of economic planning for the area must incorporate the welfare of the agricultural interests as well as the continued growth and expansion of industrial organizations.

Probably the biggest farm problem faced by Southern farmers is the difficulty of "around-the-year" marketing of farm products. In fact, the Southern harvest period for many of the field crops occurs at about the same time, thus putting the full weight of farm productivity on the market at one moment.

Further, there is little, if any, facility for storage or warehousing of such crops so that some may be withheld to maintain a higher level of prices. Farm areas that are highly successful, the Midwest is a good example, can frequently forestall heavy farm price losses by storage of some of the crop until after the first flood has passed. This in itself is a boon both to farmers and to those businessmen who include farmers as potential customers. It is the old economic law of balancing the supply of and demand for goods in order to maintain a fair and just price.

Storage facilities limited

In the Southeast area of this nation there are few storage centers that can handle even a fraction of local crops. Those storage houses that are available are small, of old design, and lacking in air-conditioning or refrigeration, so essential to the complete care of a stored, perishable farm commodity.

These crops in the South then enter the market upon harvest, flooding the consumers, or else they go to ruin because of prospective market losses. The latter is true fact, not fancy. Many Southern crops are being plowed under or rotting on the vine. Others such as milk are being poured away or fed to livestock. Such activities constitute a loss to the consumer market, an economic hardship upon the farmer who has put time and money into production, and a financial loss to the businessman and industrialist who lose potential customers for their goods.

The problem can and should be simplified and minimized by organized efforts of state governments and influential business citizens in the Southern area. Adequate capital is needed to erect proper warehousing in a central location. Georgia alone lost $43 million in farm revenue during the first six months of 1954, compared to the same period in 1953. This could have been prevented in large part by sufficient storage facilities estimated to cost $50 million.

Thus, one year's income maintained for the farmer would more than offset the costs involved. At a fair cost for the warehouse service, there is little doubt that there would be another thriving industry in the South that would materially add to the comfort of both urban and rural citizenry.

New industries for the South

Practically all of the Southern states can produce an enviable list of new industrial additions to their rosters of business. This change is caused by a variety of factors, all proving the economic worth of organizing and operating economic activities in the South.

Principal reason for this development in the minds of non-Southerners seems to be cheap and unorganized labor. However, if one talks with an executive of a newly located Southern industry, one will find this far from the case. Labor comes into a part of the story, it is true, but it usually is referred to as labor with greater productivity, and a potential that has not been reached as yet. But the economic character of the area seems to be of importance in industrial location and as such a few statistics can be of value:

Increase, 1953 over 1939	South	Non-South
Population	17%	22%
Business Volume	475.5%	408.7%
Farm Cash Income	377.0%	333.3%
Construction	1025.2%	652.7%
Manufacturing	527.5%	463.6%
Utility Output	477.5%	434.1%

All of these indicators have characteristics similar to the physician's thermometer. They bespeak the good health and prospects of the nation as a whole, but, because of their picture of the South in relation to the non-South, they show the bright future and progressive past of the Southern area.

From the point of view of the ELECTRICAL SOUTH readership, the most significant fact that can be derived from the above figures is the relationship of population growth to economic progress. Population has grown, but not at the same rate as elsewhere. Business activity and volume in the South have increased beyond the pace set by non-South areas. The result is that the per capita income of the area is in a state of great transition, from low to high.

Business directly affected

This should mean that every businessman in the area can foresee a steadily expanding true market for merchandise. In terms of marketing specialists, demand for goods is not significant until it is accompanied by the means to purchase. These so-called "means" are increasing not only in relation to over-all size, but also in relation to spread over many persons and family groups.

An all-out effort to sell, and to capitalize on this demand, will result in added business in 1954 and 1955 and should raise our economic indicators to new heights. Recognition of this fact is half the battle.

Dr. Bunting, well-known southern economist, is president of Oglethorpe University, Oglethorpe Univ., Ga.

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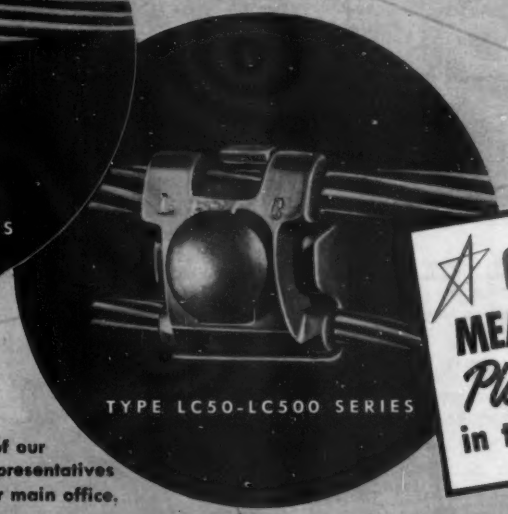

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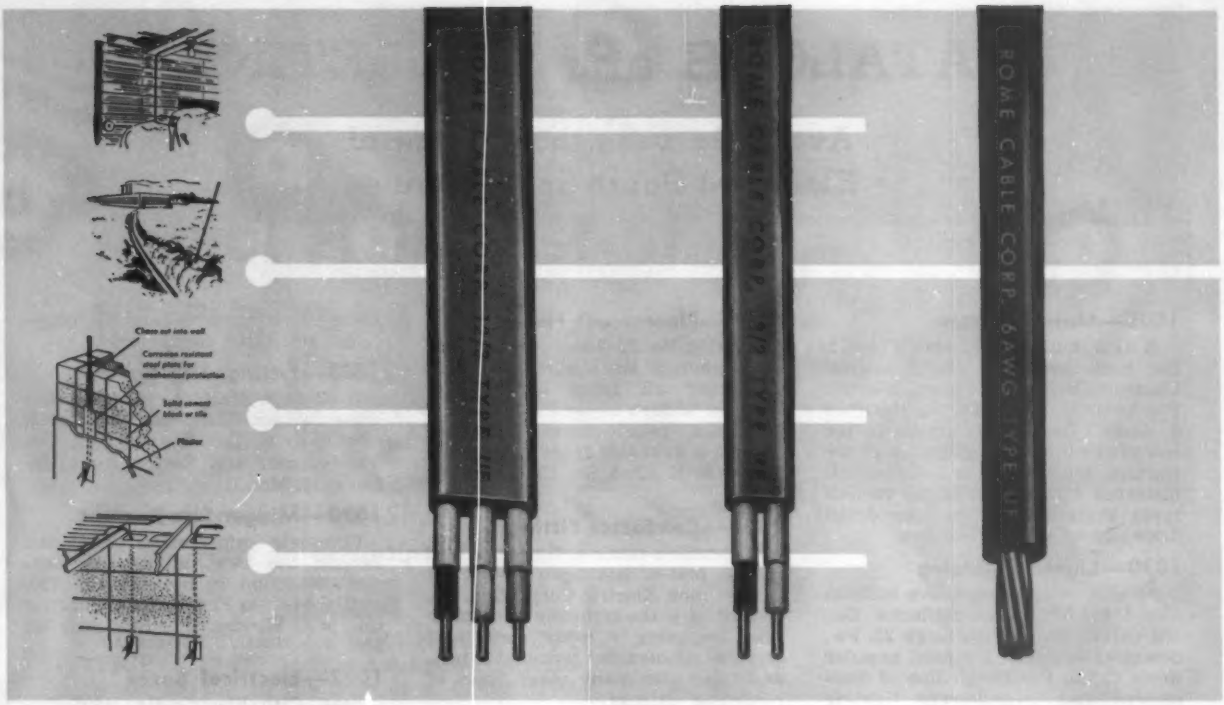
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2 It is recognized by the National Electrical Code (1953) for installation in branch or feeder circuits *buried directly in the earth*, when provided with overcurrent protection.

3 The integrally applied Rome Synthinol, Type TW, thermoplastic insulation and sheath are resistant to wet and corrosive conditions.

4 It's manufactured in sizes 14 AWG through 4 AWG standard color, black—packaged in 500-ft. coils—600 volts.

Two- and Three-Conductor FlexAll

It has UL approval as both Type UF and Type NMC (Nonmetallic Sheathed Cable—Corrosive Resistant).

It has National Electrical Code (1953) recognition for:

- Branch or feeder circuits *buried direct in earth*, with proper overcurrent protection.
- *Interior wiring*, either exposed or concealed, in corrosive, wet or dry locations.
- Installation within hollow spaces of *outside or inside* masonry *block or tile walls.*
- Embedding in plaster or shallow chase in masonry, when suitably protected.

The high-quality insulation is Rome Synthinol. Individual conductors are covered with an inorganic glass yarn wrap. Over the assembled conductors there's a Rome Synthinol sheath. Rome Synthinol is flame, rot, abrasion and moisture resistant for safe installation under wet or corrosive conditions.

It is manufactured in sizes 14 AWG through 10 AWG—standard color, pearl gray—in cartons of 250 ft.—600 volts.

Add all these features together—and you are in a better position to land the next job . . . without sacrifice to profit.

Another **Rome** *first . . .*

New Glass Covered Triple Knit Weatherproof Wire . . . 2 inside coverings of cotton and an *outer cover of glass yarn.* There are 4 big installation advantages:

1. *Resistance to Weathering*—With its inherent resistance to weathering, the Fiberglas outer cover prevents festooning.
2. *Moisture Resistance*—Glass fibers individually resist moisture absorption, and with asphaltic compound attain even higher resistance.
3. *Tensile Strength*—Glass yarn has tensile strength several times that of organic fibers.
4. *Chemical Resistance*—Glass fibers are not affected by oils and are resistant to most acids.

The permanency of glass, YOURS now on Rome Triple Knit Weatherproof—sizes 14 AWG through 4 AWG—in special wholesaler's package of 500 feet.

It Costs Less to Buy the Best

ROME CABLE ROME, N.Y.

ROME CABLE
Corporation
ROME · NEW YORK
and
TORRANCE · CALIFORNIA

CATALOGS and BULLETINS

Available Free to Readers of Electrical South upon Request

1008—Motor Starters

A new bulletin, Number 514-515, has been issued by the Industrial Controls Division of Federal Electric Products Co., 1429 Park St., Hartford 6, Conn. Describing in detail the company's line of combination motor starters, the booklet is copiously illustrated with photos of the various types available and includes detail drawings of special features.

1030—Lighting Catalog

An eight-page descriptive bulletin issued by Pittsburgh Reflector Co., 450 Oliver Bldg., Pittsburgh 22, Pa., describes in detail the most popular items in the Pittsburgh line of fluorescent and incandescent lighting equipment. Each item is fully illustrated and cataloged and many are accompanied by installation plans.

1032—Receptacles and Plugs

Russell & Stoll Co., Inc., 125 Barclay St., New York, N. Y., has released a bulletin, No. EL-4-46, describing the new Ever-Lok receptacles, plugs and cord connections for 30 amperes, 440 volts, a-c. Typical uses are for heavy duty industrial purposes.

1048—Plug-In Strip

An illustrated catalog showing the complete "Plug-in" Strip line has recently been pulblished by National Electric Products Corp., Pittsburgh, Pa. This eight-page illustrated brochure pictures the three and six foot standard lengths of the multi-outlet branch circuit assembly.

1054—Fluorescent Fixtures

Catalog No. 53 illustrates 74 pages of commercial and industrial designs. Featuring all types suitable for schools, industrial and commercial buildings, retail stores, etc. This catalog is available from the Kayline Co., 2480 E. 22nd St., Cleveland 15, Ohio.

1058—Conductor Fittings

A complete catalog, illustrated and listing prices, has been issued by Penn-Union Electric Corp., Erie, Pa. Described is the company's complete line, including a wide variety of service connectors, terminals, tees, and taps; also many other types of conductor fittings.

1076—Modular Lighting

A 20-page booklet containing interesting and useful information about the "modular system" of lighting can be obtained by writing to the Mitchell Manufacturing Co., 2525 Clybourn Ave., Chicago 14, Ill.

1082—Lighting Equipment

Preprints of the F. W. Wakefield Brass Co.'s eight-page section on lighting which will appear in the 1954 Sweet's Catalog are available on request to Wakefield, Vermilion, Ohio. Included are descriptions of 11 major types of lighting equipment.

1086—Cable Connectors

Tomic Sales and Engineering Co., 4864 Woodward Ave., Detroit 1, Mich., now have available catalog sheets containing data on the complete line of their connectors, couplings, and cable connectors.

1088—Fittings and Fixtures

A 32-page illustrated catalog covering Killark fittings and fixtures is offered by Killark Electric Mfg. Co., Vandeventer and Easton Aves., St. Louis 13, Mo.

1090—Midget-Size Busduct

Complete information on Power Plugin, the new, midget-size busduct, is found in bulletin No. 720, available from Frank Adam Electric Co., 3650 Windsor Pl., St. Louis 13, Mo.

1092—Electrical Boxes

Steel City Electric Co., 1207 Columbus Ave., Pittsburgh 12, Pa., offers a catalog of their complete line.

1110—Aluminum Cables

A new 16-page booklet, OK-1070, published by the Okonite Co., Passaic, N. J., contains the latest information on insulated aluminum power cables. It is based on two AIEE papers and reviews the properties, problems and advantages.

1130—Conduit Fittings

The latest completely illustrative catalog on their diversified line of conduit fittings is announced by the Atlantic Conduit Fittings Co., 589 Atlantic Ave., Boston 10, Mass.

1136—Space Heating Guide

Cavalier Corp., Chattanooga 2, Tenn., has prepared a Guide for Cal-

ELECTRICAL SOUTH
806 Peachtree St., NE
Atlanta 5, Ga.

August, 1954

Gentlemen:

Please send me the bulletins and catalogs indicated.

(Print Plainly)

Name ..... **Title** .....

Company .....

Address .....

City & State .....

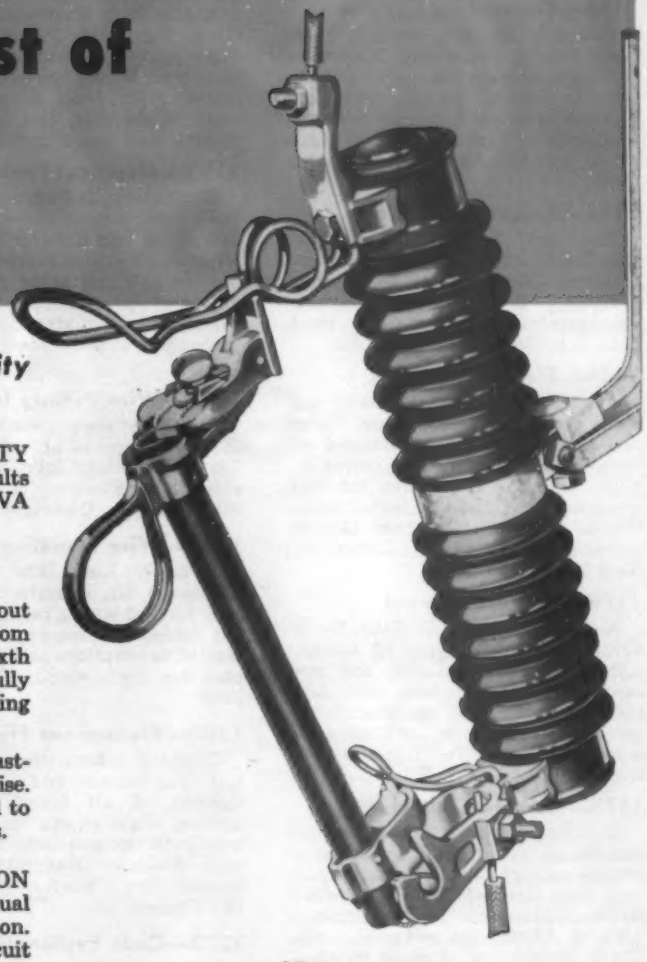
Circle numbers below. Bulletins and catalogs will be mailed promptly.

1008	1030	1032	1048	1054
1058	1076	1082	1086	1088
1090	1092	1110	1130	1136
1150	1156	1166	1172	1178
1182	1184	1186	1188	1190
1192	1198	1200	1202	1204
1208	1214	1218	1220	1222
1224	1228	1230	1232	

More PROOF !

QUALITY CUTOUTS PAY OFF IN LOWER MAINTENANCE

Actual Field Test of KEARNEY H-D TRIP-OUT



Demonstrates High Short Circuit Interrupting Capacity

TEST:

A standard, 100 ampere, 15 KV HEAVY DUTY TRIP-OUT* (16234-3) was subjected to faults made on the 15 KV side of a 10,000 KVA transformer.

RESULTS:

At 14.4 KV with a 20% power factor, the cutout successfully interrupted six shots ranging from 7620 to 8750 amperes, RMS. After the sixth shot, the cartridge and contacts were carefully examined and found to be in perfect working condition.

After the short circuit test, without any adjustment, the cutout was tested for temperature rise. The maximum found was 13°C, as compared to the 30°C allowed by NEMA on new cutouts.

NOTE: These reports are NOT BASED ON CALCULATION! They are the results of actual field tests at Kearney's 34.5 KV substation. Power was taken from the Union Electric circuit providing a 445,000 KVA backup.

**Taken at random from the regular production line.*

JAMES R. KEARNEY CORPORATION ST. LOUIS, MO. GUELPH, ONT.

The Mark of Quality Products

Kearney high-quality cutouts cost you less in the long run. Built to last, they have such engineered refinements as: auxiliary spring contacts for added trip-out torque, heavy fuse tubes lined with horn fibre, and cast bronze operating parts. These and other Kearney quality features are your assurance of more economical, safer and longer-lasting protection for your distribution circuits. Ask your Kearney Representative to show you the Trip-Out engineered for your load and fault conditions.

JAMES R. KEARNEY CORPORATION
4224-42 Clayton Ave. • St. Louis 10, Missouri
Canadian Plant: Guelph, Ontario

Specify **KEARNEY Products**

For Better Construction . . . For Safer Maintenance

culations of Electric Space Heating. It is based on study of several thousand installations of electric heat and is a handy reference for calculating electric heating requirements and estimating operating costs. The booklet contains discussion, charts, and floor plan examples.

1150—Fluorescent Fixtures

Colorful, 20-page catalog. Front cover shows interesting illustration of "Light through the Ages." Catalog gives complete specifications and pictures of entire Naturlite line manufactured by Light & Power Utilities Corp., 1035 Firestone Blvd., Memphis, Tenn.

1156—Industrial Lighting

The new Abolite Catalog and Handbook contains a complete descriptive story of all commercial, industrial floodlighting equipment manufactured by Jones Metal Products, Inc., West Lafayette, Ohio.

1166—Electrical Fittings

A 40-page illustrated catalog and price list on the Gedney line. Shown and listed are conduit, threaded entrance, SEC, EMT and ground fittings, and box connectors for both armored and non-metallic cable. Copies are available from Gedney Electric Co., RKO Bldg., Radio City, New York 20, N. Y.

1172—Busduct Manual

A 68-page manual, Bulletin No. B-4272A, describing types of busduct and accessories available, and presenting application and test data, specifications, and information on pricing a typical busduct installation is available from Westinghouse Electric Corp., Box 2099, Pittsburgh, Pa.

1178—Remote-Control Wiring

Bulletin 16-200 is a 36-page manual describing layout and installation of remote-control wiring, and is available from General Electric Co., Construction Materials Dept., Bridgeport 2, Conn. Advantages and explanation of the system are followed by illustrated installation procedure.

1182—Switch Insulators

A new bulletin giving specifications, engineering data, contours, dimensions, etc. on its full line of Switch and Bus Insulators has been recently published by Victor Insulators, Inc., Victor, N. Y. Write for Bulletin No. 5 or use reply coupon.

1184—Approved RHW Wire

Bulletin No. 1018 describing first Underwriters' Approved Type RHW Wire, developed to meet the new National Electrical Code standards, is available from Simplex Wire and Cable Co., 79 Sidney St., Cambridge 39, Mass.

1186—Electric Heating File

This file offered by Electromode Corp., 45 Crouch St., Rochester 3, N. Y., is made up to suit individual requests for information on Electromode Heaters for domestic, industrial or farm use; or to contain material on the complete Electromode line if desired.

1188—Dry-Type Transformer

An eight-page illustrated booklet on the Type E, totally-enclosed, nonventilated dry-type transformer is available from Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa. Made in ratings from three to 50 kva, the transformer provides greater economy for plant distribution systems where dirt, lint, and non-explosive dust are a problem.

1190—Electrical Fittings

Blackhawk Industries, Dubuque, Iowa, offer a new two-color bulletin describing and illustrating B-I Electrical Fittings and Fixtures. Included are conduit and cable fittings, conduit and cable straps, staples, box supports, sill plates, locknuts and bushings, wire holders and yard lights.

1192—Wire Pulling Lubricant

Illustrated six-page folder showing the advantages of an improved Y-Er Eas wire pulling lubricant is available from Electro Compound Co., 3812 150th St., Cleveland 11, Ohio.

1198—Wire Handling Devices

Clyde W. Lint, 2323 W. 18th St., Chicago 8, Ill., manufacturers of the Jiffy Line of wiring handling devices, has issued a three-page catalog insert of descriptions and price schedules for the materials in the Jiffy Line.

1200—Fluorescent Fixtures

Complete information on commercial fluorescent and incandescent lighting of all types, for offices, schools, libraries, etc., and all industrial locations available from Benjamin Electric Manufacturing Co., Leader Div., Northwest Highway, Des Plaines, Ill.

1202—Code Explanation

Bulletin 2660 contains up-to-date information (following 1953 Code revision) on why equipment for hazardous locations is designed and built as it is, and is available from Crouse-Hinds Co., Wolf & 7th, No., Syracuse 1, N. Y.

1204—Conduit Fittings

Illustrated Catalog available upon request to Electrical Fittings Corp., Woodside, N. Y., or their nearest warehouse in your locality contains complete information on the company's electrical conduit fittings, conduit nipples, couplings, and elbows.

1208—Contemporary Lighting

Two brochures describing contemporary lighting fixtures for residential, commercial and display purposes. Included are sizes, types, framing-in details, illustrations. Prescolite Mfg. Corp., 2229 Fourth St., Berkeley 10, Calif.

1214—General Catalog

General catalog of Royal Electric Co., Inc., Pawtucket, R. I., covering flexible service and lamp cords, cord sets, extensions, trouble lights, wiring devices and decorative Christmas lighting is available to wholesalers. Dealer catalogs may be secured from Royal distributors.

1218—Carbon Products

A 28-page catalog on Motor and Generator Brushes and carbon products telling how to order brushes, grade recommendations, characteristics and description of brush grades is available from the Helwig Co., 2536 North 30th St., Milwaukee, Wis.

1220—Stadium Lighting

The Pyle-National Co., 1334 N. Kostner Ave., Chicago, Ill., announces the availability of a new eight-page bulletin, No. 605, on stadium lighting, describing in detail floodlighting of a typical outdoor athletic arena stressing the importance of using fully enclosed floodlights.

1222—Carbon Lamps

Nalco Candylbeme decorative carbon lamps are the subject of a new leaflet which is now available from North American Electric Lamp Co., 1014 Tyler St., St. Louis, Mo. Descriptions, specifications, and list prices are given for the lamps.

1224—Electrical Equipment

The Wadsworth Electric Mfg. Co., Inc., Covington, Ky., has issued a new catalog Con 15-0 and Bulletin W. C. B. 53-1, containing data on their lines of Safety Switches, Service Equipment, Distribution Panels and "E-Z-RED" Circuit Breakers.

1228—Time Controls

A revised and enlarged edition of the booklet "How Time Controls Save Work, Time and Money on the Farm" has been announced by the Paragon Electric Co., Two Rivers, Wis. The revised edition includes new time control applications devoted to showing farmers how to earn more money by actually doing less work.

1230—Hot Line Repairs

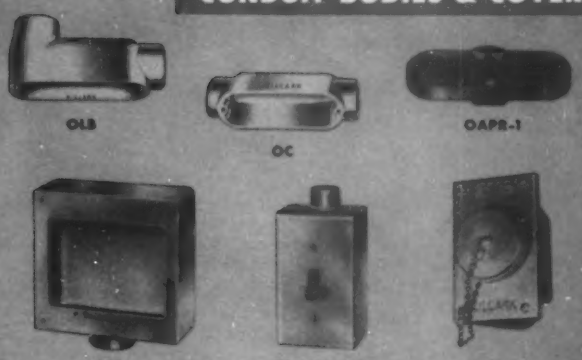
Twenty time-saving techniques for making hot line repairs and replacements are detailed in a new 72-page, spiral-bound, pocket-size book for on-the-job use. Included are useful charts giving the characteristics of all bare conductors. Copies are available from James R. Kearney Corp., Dept. HF, 4236 Clayton Ave., St. Louis 10, Mo.

1232—Electrical Controls For The Textile Industry

Fully described in 8-page circular by The Arrow-Hart & Hegeman Electric Co., Hartford 6, Conn. Includes: shock-resistant, lint-proof Loom Switch and also Starters, Contactors and Combination Starters in lint-proof NEMA XII enclosures.

SEALED BEAM FIXTURES

CONDUIT BODIES & COVERS



KILLARK

SERVICE ENTRANCE FITTINGS

the **FIRST**

to bring you

a *Complete* line of

Aluminum Fittings & Fixtures

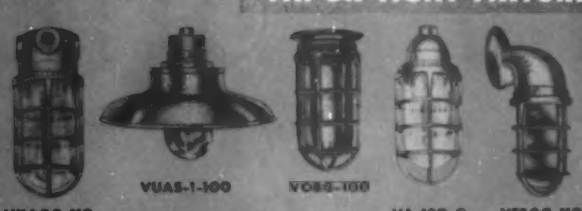
EXPLOSION-PROOF FITTINGS & FIXTURES

Quality-Designed in

KILLARK ALUMALLOY

...the 20th Century Metal!

VAPOR-TIGHT FIXTURES



There's a Killark Fitting or Fixture in the Right Size and the Right Style to Fit Your Installation Needs.

KILLARK ST. LOUIS

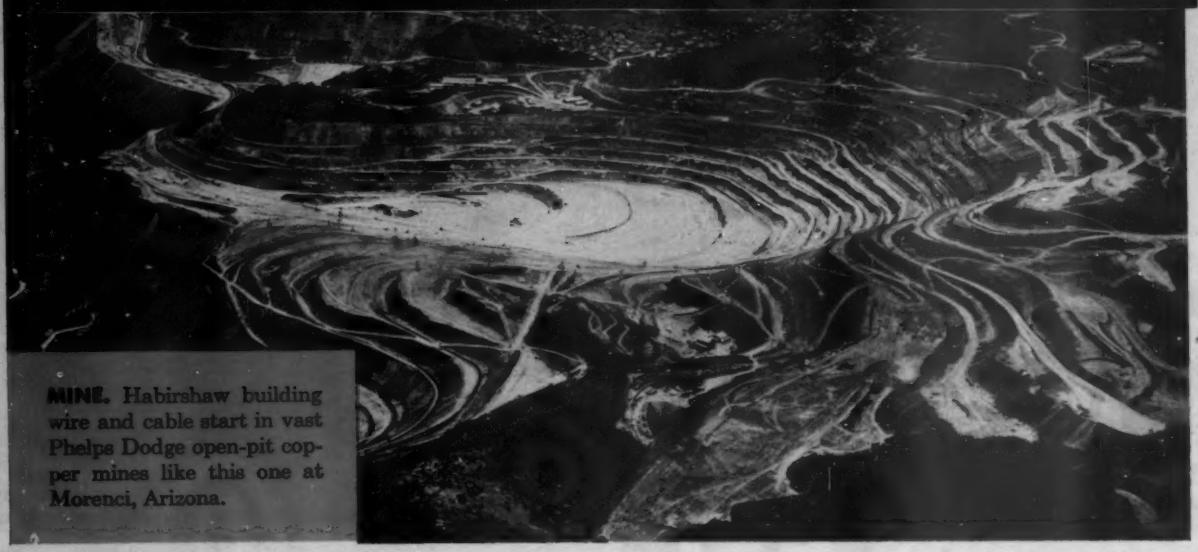
Killark

ELECTRIC MANUFACTURING COMPANY

Vandeventer and Easton Aves. · St. Louis 13, Missouri

SALES OFFICES and WAREHOUSE STOCKS	Atlanta	69 Mills Street, N. W.	Dallas	1901 Griffin Street	Philadelphia	2014 Chancellor St.
	Boston	156 Purchase St.	Denver	1073 Galapago	Pittsburgh	50 26th St.
	Buffalo	18 Quay St.	Detroit	8319 Mack Ave.	San Francisco	714 Harrison St.
	Chicago	1528 West Adams St.	Los Angeles	412 Seaton St.	Seattle	4130 First Avenue South
SALES OFFICES	Baltimore	11 W. 25th St.	Columbus	2700 E. Main St.	Minneapolis	826 Andrus Bldg.
	Cincinnati	49 Central Ave.	Kansas City, Mo.	616 W. 26th St.	New York	600 W. 181 St.

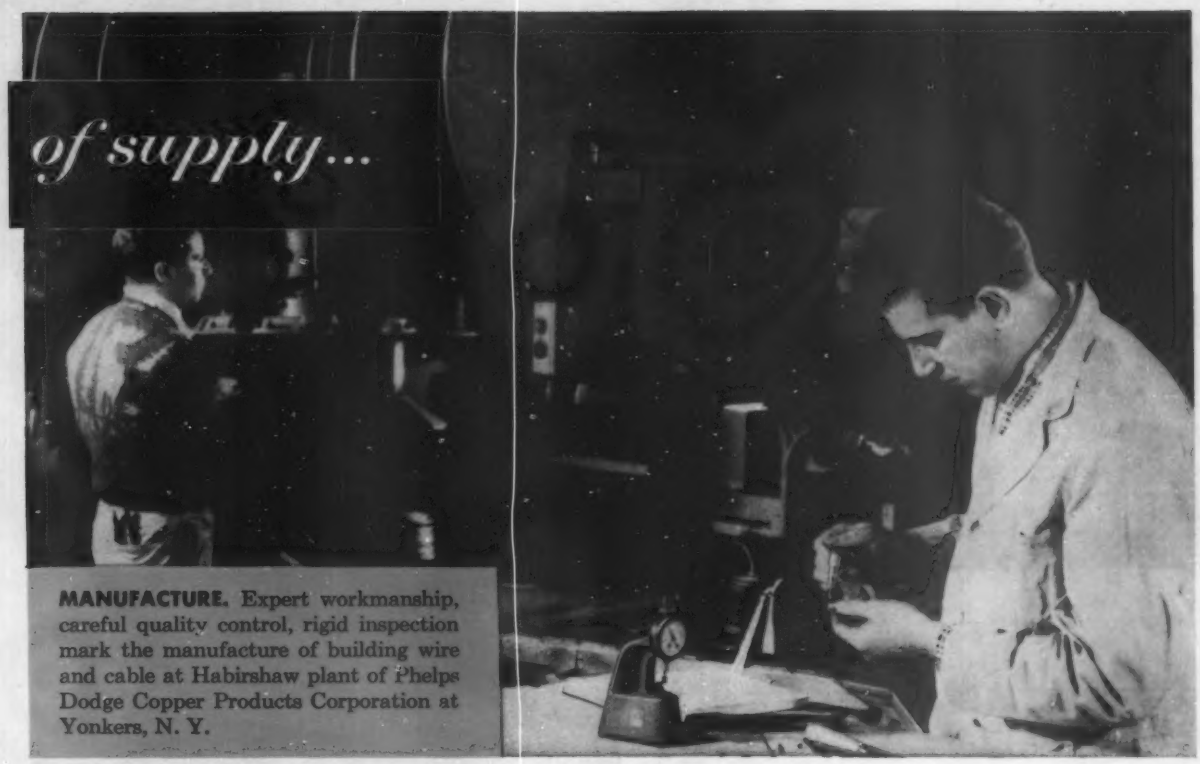
When you need a dependable source



MINE. Habirshaw building wire and cable start in vast Phelps Dodge open-pit copper mines like this one at Morenci, Arizona.

IT PAYS TO SEE A PHELPS

MARKET. Delivery of Habirshaw building wire and cable by Phelps Dodge distributors to job site is final step in unified "Mine to Market" operation.



MANUFACTURE. Expert workmanship, careful quality control, rigid inspection mark the manufacture of building wire and cable at Habirshaw plant of Phelps Dodge Copper Products Corporation at Yonkers, N. Y.

DODGE DISTRIBUTOR!

Phelps Dodge's complete "Mine to Market" program assures distributors dependable supplies and service

Here's what "Mine to Market" means to you:

1. ***A CONSTANT SUPPLY OF RAW MATERIALS.***
2. ***HIGHEST QUALITY WORKMANSHIP.***
3. ***PROMPT DELIVERY — all from one major source.***

Phelps Dodge distributors are an integrated part of this system, profit from working closely with a primary copper producer and fabricator.

PHELPS DODGE COPPER PRODUCTS CORPORATION

WIRE BY PHELPS DODGE MEANS WIRED FOR LIFE!

LOOK AT DAY-BRITE

VIZ-AID®

Standard of the industry. One of the most imitated commercial fixtures on the market. In Rapid-Start, 2- and 4-lamp units.

LENOX®

Highest quality commercial fixture available to fit the modest lighting budget. Low in cost, high in appearance and performance.

LUVEX®

All metal Slimline and Rapid-Start fluorescent. One-piece, 8-foot section. Hot bonded super-white finish.

FEEL THE DIFFERENCE

PLEXOLINE®

A complete lighting system. Linear sections and circular accent units permit unlimited lighting patterns including curves, angles, abstract designs. Slimline and Rapid-Start fluorescent.

MOBILEX®

Flexible recessed lighting system designed for use with new, low-cost grid-type and spline suspended ceilings. Moulded plastic, glass and louvered shielding.

...BEFORE YOU BUY

This is just a glimpse of the nation's leading line of lighting fixtures. Whatever the lighting job, there's a quality Day-Brite fixture to do it—not just as well, but better!

Best way to have the full picture of the Day-Brite line is to have an up-to-date catalog. If you don't already have one, write to the address below.

DAY-BRITE LIGHTING, INC., 5435 Bulwer Ave., St. Louis 7, Mo. In Canada: Amalgamated Electric Corp., Ltd., Toronto 6, Ontario.

DECIDEDLY BETTER DAY-BRITE Lighting Fixtures

459

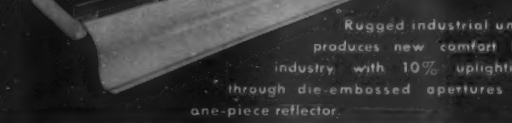
TROFFER SERIES

Four interchangeable shielding elements fit basic channel. Bath flange and snap-in types. In Slimline and Rapid-Start fluorescent.

PARA-LOUVER® TROFFERS

Alzak aluminum parabolic unit with sensational new PARA-LOUVERS —reduces lengthwise brightness up to 50%.

CFI DAY-LINE®



Rugged industrial unit, produces new comfort for industry with 10% uplighting through die-embossed apertures in one-piece reflector.

USED THE MOST FROM COAST TO COAST

For many years Contractors from Coast to Coast have used Briegel All Steel Indenter Fittings. U. L. approved as concretetight and for general use, B-M Indenter Fittings are faster, easier to use and neater in appearance.

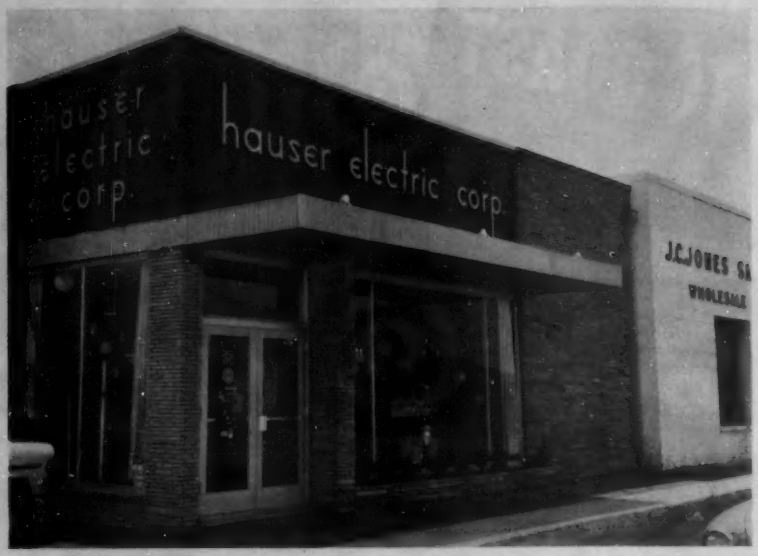
Installation is simple and less expensive. Two quick squeezes sets them forever. Try B-M Indenter Fittings and get more profits from each job!

BRIEGEL METHOD TOOL CO.
GALVA, • ILLINOIS

Warehouse Stocks in Principal Cities for Immediate Delivery!

In Norfolk, George Hauser has built his very successful business on home wiring jobs that are way above adequate wiring standards

This



Hauser Electric Corporation, Norfolk, Va., moved into their new business headquarters recently and are well pleased with their suburban location.

Melvin E. Manuel, Hauser's heating engineer, devotes all his time to calculating the needs of electrically heated homes, one of the firm's specialties.

◆ STRESSING QUALITY in home wiring has proved to be the secret of success for George F. Hauser, president of Hauser Electric Corporation, 6300 Cottage Toll Road, Norfolk, Virginia. And, dealing in "super" wiring for fine homes has built the Hauser organization into one of the largest contractor operations in Virginia's Tidewater section.

George Hauser first entered the electrical contracting field in 1937, working for other contractors until the outbreak of World War II. Following his release from service, he decided to go into business for himself.

Quality builds business

"I tried doing competitive work for a while, but found that I was always getting behind instead of getting ahead in the business world," Mr. Hauser said. "So, I decided to set high standards and do only quality work. It was rough going for a few months, because it was a little difficult selling home builders on spending more money for a wiring job which included a number of things that our competition said wasn't needed. But, now, we have made a name for ourselves in Norfolk, and we average four out of every five jobs we bid on."

According to George Hauser, "Adequate wiring is the easiest thing in the world to sell," and through his long work with project builders and architects his firm is getting all the business it can handle, and sometimes even more.

The wiring standards set-up by Mr. Hauser are actually higher than those of the National Adequate Wiring Bureau. Mr. Hauser says that representatives of the Bureau have called on him and investigated his standards.

Mr. Hauser first became interested in quality home wiring upon reading an account of a three-wire system by an Illinois professor, several years ago in ELECTRICAL SOUTH. Today he uses three-wire

by Virgil S. Price

contractor insists on quality wiring

Hauser Sales Manager George A. Fields, Jr., assists a home builder in selecting fixtures in the modern display room. Walls and ceiling of the room feature 42 outlets, enabling salesmen to show many fixtures.

No. 12 as a minimum and places receptacles so that the home owner will have a 220-volt outlet in every room in the house. His firm has been able, by increasing labor efficiency, to wire a home with the three-wire system as cheaply as they could by the old two-wire system in the past. Hauser's specializes in remote control wiring and the majority of their jobs today include a complete remote control system.

Among the standards set up by Hauser Electric—they will not take any job to wire a home with less than 100 ampere service; they will not wire any home with less than 20 circuits, and usually insist on 80; and they guarantee all their work for five years.

Mobile phone service

One thing that has contributed to the increase in labor efficiency, according to Mr. Hauser, is mobile phone service. One of these phones is located in his personal car and another is located in a fully equipped truck that roams the area between jobs it has completed.

This service saves the Hauser organization over $200 a month in lost labor alone, not to mention the good will the fast, efficient service builds.

On several occasions, due to the location of the roving truck, a customer has been able to have a serviceman at her disposal within a few minutes after a call has been placed. This usually amazes the customers but it keeps them well pleased with the service.

Today it is not unusual for Mr.

Hauser's organization to wire a house with 400 ampere service. His "super" wiring salesmanship has built up the firm's reputation to such a degree that people who come to them expect to pay more for a wiring job.

"Don't get me wrong, now," Mr. Hauser says, "I don't operate on the practice of some professions and charge the customer what I think he can afford to pay. They couldn't get the service and materials I put into a wiring job for a dime cheaper from anyone else. It's just that in order to sell adequate wiring you have to sell up. We try to sell the idea that the home builder should double today's actual wiring needs when building a new home, because events of the past have shown us that you can never be sure of how much electricity you will need from one year to the next. We make every effort to wire the customers home as near to the 'ideal' as we believe it is possible.

Satisfy the customer

"In order to sell more wiring, adequate wiring, quality wiring, or whatever term you wish to apply, you are going to have to get people out of the rut of thinking they can get a house wired adequately for $200-$300. The electrical contracting business today needs more of a competitive spirit," Mr. Hauser says, "not cheapness and cheating."

Hauser Electric is always vitally interested in the well being of their customers; how they feel about the job and the service being rendered, because they feel that satisfied customers are their best advertisement.

"When you need friends, the more you have, the better off you are," Mr. Hauser says. And, when a prospective customer calls to get

(*Continued on page 76*)

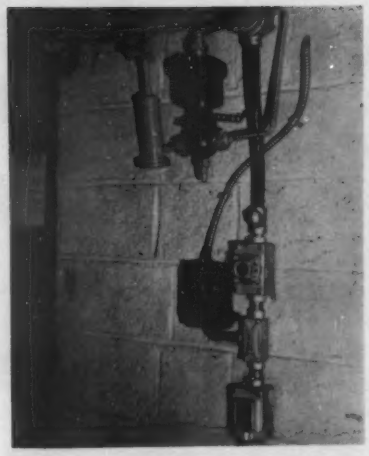
Hauser used an eight-story tower for outside work in rewiring Banker's Trust Building, in Norfolk. Entrances were drilled through one-foot walls.

Mr. Hauser takes a call on his auto's mobile phone, a device that saves his firm over $200 a month, and saves labor hours as well.

Three of the Hauser Electric staff are shown at home of Architect George Van Leewen of the firm Rudolph, Cook and Van Leewen, Norfolk. Left to right are Elmer Seay, Bill Henry and Lewis Lee. Home features 80 circuits, all circuit breaker protected, wired in three-wire No. 12 on all 20 amp circuits. The kitchen and utility areas are each on separate 110 circuits with 220 potential available. Remote control switching is used throughout. The home also features electric radiant heating installed in the room ceilings, averages 12 outlets in each room, has a total 300 ampere capacity and is a typical Hauser job.

Installing air conditioning for film storage vaults

by Frank W. Seal
Engineer, E. R. Seal Co.
Washington, D. C.



Thermostat, pilot light and disconnect switch for each vault.

Compressor used in film storage vault installation for government.

◆ IN THE INSTALLATION of air conditioning in film storage vaults for the government, a number of problems arose in the layout of equipment due to the very confined space.

The installation involved 22 vaults, sealed and explosion-proof, in each of three buildings. A small unit ventilator in each vault took care of refrigeration. We installed a thermostat, pilot light, and disconnect switch in each vault.

To meet the problem of limited space and explosion-proof type of wiring, we found the best solution was to get a collection of pipe nipples in every size available. Using power equipment throughout for threading and cutting pipe, we saved considerably in labor costs. We had to put seal-offs in each one of the vaults where there were lights and pilot switches. With 140 of these to pack and fill, we found that by mixing a compound in a teakettle and pouring all at once, rather than each individually, we effected further savings.

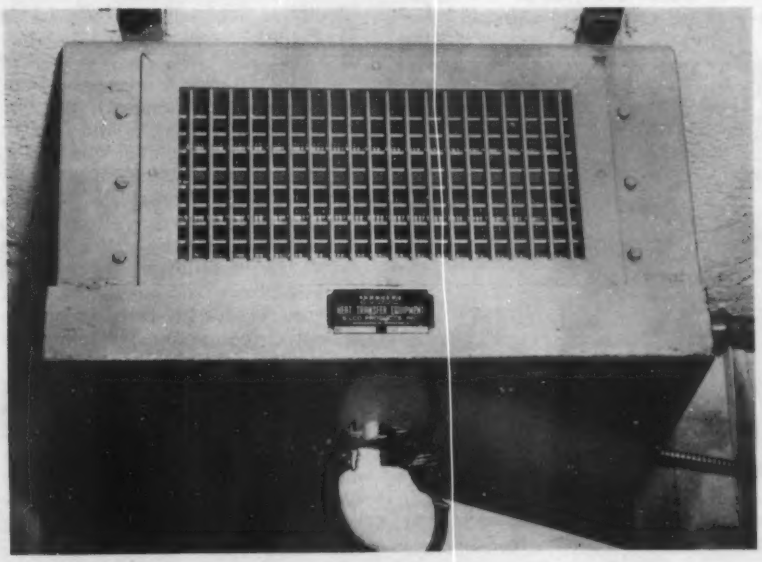
Restrictions on the job created certain difficult conditions. We could not operate any arc-producing machines within the building. It was necessary for us to have a small temporary shed outside where pipe cutting was done.

Part of the job consisted of removing an existing 100 kva transformer with its feeder, a 500-foot run of two-conductor 15 kv cable. This particular phase had to be accomplished without outage during normal working hours. In order to avoid overtime expense on the job, we were able to set one pole and bring in temporary service from a different source. This enabled us to perform all work except the final splice and testing of equipment on straight time.

We had a two-conductor cable to pull out of the ducts and a new three-conductor cable to pull in; there was a transformer to take out of the transformer vault and a new transformer to be installed in its place. We had to splice in the manhole by the transformer and make up the transformer pothead.

In pulling out the two-conductor cable, we used two winch trucks. We had one winch truck at each end of the duct line and as we pulled the old cable out, we pulled the winchline from the second truck into the duct. When it was time to pull the new cable in, we merely had to connect onto the winchline and pull it in.

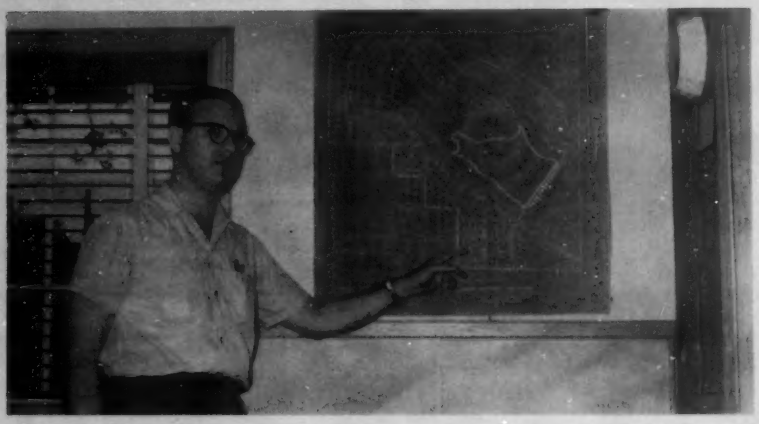
We designed and built a special roller to go over the lip of the manhole to enable us to pull out the old cable without damaging the installation.



A small unit ventilator in each vault to take care of refrigeration.

Earl Fewell, left, and his partner, Windle Price, right, frequently talk to each other in their station wagons at different points away from the office. "Two way radio makes it possible for us to be two places at once."

Bookkeeper Katherine Kane acts as dispatcher at the base station. She logs calls and truck locations.



Engineer C. B. Young charts the location of trucks and jobs at the large Broadmoor housing project which will have all air conditioned units.

A corner of the attractive sales floor where home builders come to select fixtures. Miss Ruth Qualla sometimes operates radio from here, too.

Contractors'

◆ BETTER CUSTOMER SERVICE and elimination of much lost time were the benefits expected from the installation of a shortwave radio station in the building of Price-Fewell Electrical Contractors, North Little Rock, Ark., some six months ago at a cost of $4,000.

The installation allowed the company to equip several units of their fleet of 14 trucks and cars to send and receive two-way calls. Careful records kept from the start reveal some astonishing results. First of all, according to Earl L. Fewell, co-owner with Windle Price, the installation has without doubt already paid for itself.

From records provided by an excellent bookkeeping system and from charts that tell the complete story of the way his nine operating crews handle their trucks on the job and between new assignments, Mr. Fewell knows exactly how much time is saved every week by two-way radio communication between trucks, supervisors' cars, and the plant.

From the tower on top of the converted unfinished church building which the company has remodeled to suit its needs, the short-wave two-way radio station broadcasts to and receives calls from 12 trucks and cars of the contractor's fleet. The total cost of the short-wave system ran to about $4,000 and soon paid for itself.

two-way radio paid for itself

by S. W. Ellis

"We save forty man hours a week," he declares. "Those hours represent travel time between jobs saved by the efficient routing and rerouting made possible by two-way radio. Other precious minutes and hours are saved which formerly were consumed when our men had to hunt a telephone and call into the office for instructions.

Lost time eliminated

"Before we had two-way radio service, we lost time practically every day when work was blocked on a job. Maybe the crew started out a little early and found the building locked. Or maybe a subcontractor on a building held our men up. Now a radio call to headquarters enables us to assign a new job immediately to the waiting crew."

Starting with equipment for two-way reception in two units of the fleet, the owners now have twelve mobile stations. The base station consists of the inside transmitter and two inside units for sending and receiving calls.

The building owned and occupied by the partners is well adapted to short-wave broadcasting and reception. Four years ago they bought an unfinished church, near a business section—four expansive walls, a roof, and a square block of ground. Spending $10,000, they finished the structure into a handsome showroom for fixtures, offices, work and recreational rooms for eighteen electricians, and then they left some space for future expansion.

The short-wave radio installation was made about the time the company secured the contract to do the wiring for the 700-unit Broadmoor housing project. This project has received national attention because all houses will be completely air conditioned.

When Earl Fewell and Windle Price sought a way to save time and give better service on the housing project, in addition to their other work, two-way radio service for the trucks seemed the logical solution to the problem. It has turned out to be a happy, profitable solution.

Personnel arrangement

This organization of twenty-four people is completely departmentalized, and a new department was created for short-wave radio service. The base station was set up in the office of the bookkeeper, Miss Katherine Kane. Without previous training, she immediately was able to take charge of all radio dispatching. A telephone-type microphone at her elbow enables her to turn from her accounts to receiving and sending calls.

When Miss Kane is temporarily absent from her desk, the dispatching service is switched over to the next room, to the desk of Miss Ruth Qualla. Her duties are a combination of typist, receptionist, and saleswoman, and her desk is on the sales floor. A green light on her short-wave unit shows when the service has been switched to

(*Continued on page* 80)

Master panel in the basement of the Gulf Life Insurance Company building is supplemented by circuit-breaker-type distribution panels on each floor, controlling the 2,500 ampere, 120/208 volt, load.

An elaborate system of floor ducts is installed, using 31,000 feet of duct. 500 floor plugs provide an outlet every 18 inches.

Gulf Life ordered an

Electrified

◆ POSSIBLY THE MOST EXTENSIVE electrification job ever installed in a Jacksonville, Florida office building has just been completed in the Gulf Life Insurance Company's new seven-story and penthouse structure. No expense was spared to make this one of the most thoroughly electrified jobs within the experience of the electrical contractor, the Stinson Electric Co., of Jacksonville, of which Ralph Ramis is owner.

Cost-plus contract

So eager were the officers and directors of the insurance company to get maximum advantage from full use of electricity that the job was let on a cost-plus basis and added up to about $190,000, or roughly 10 per cent of the cost of the entire building, which will run between $1,500,000 and $2,000,000. The electrical work has been done as the other work on the building has progressed over about a year and a half. Except for oil heat, the building is 100 per cent electrified, including operation of compressors for three 100 horsepower Trane air conditioning units, which will utilize the same ducts for cooling as will be used in the winter for heating.

The new building, at 124 West Ashley Street in the downtown area, adjoins a smaller building which the Gulf Life Insurance Company has been occupying for some years. The two buildings have been joined together. The old building will be completely rejuvenated with modern electrical lighting and appurtenances, but control panels in the new building will serve both structures. The new structure has seven office floors, each with 11,000 square feet of floor space, and an eighth floor penthouse of 3,600 square feet to serve as a recreation room for employees. An employees' cafeteria in

building

by C. E. Wright

the basement is served by an all-electric kitchen.

Steel floor ducts

Because many employees of the company will be using electrically-operated equipment such as dictating machines, electric typewriters or IBM accounting machines, an elaborate system of floor ducts and outlets was installed. About 31,000 feet of floor duct was laid, said to be the largest amount ever used in the Southeast in a building of this size. Steel conduit was used throughout, no steel tubing or BX. On the seven floors, 500 floor plugs, all of them brass, will serve all of the desks that are installed and provide flexibility in the event of any future rearrangement of departments or work. There is a floor outlet every 18 inches.

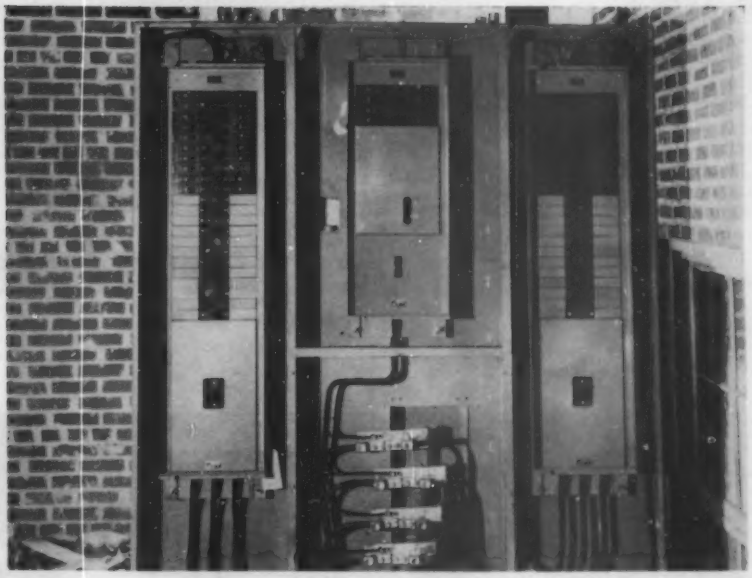
No "hot" wires are run in the ceilings, the ceiling lighting fixtures being fed from floor ducts. Fluorescent lighting is used throughout the building with very few exceptions. Fixtures are recessed in the ceilings, with some assemblies having an incandescent accent light in the center. Ceiling fixtures, instead of being suspended as has been customary, were installed with Unistrut, which is buried in the plaster. While the initial cost was a little higher than for the standard practice, this was offset by the fact that use of this device saves time in lining up the fixtures and requires no braces.

Lighting installations

Special lighting effects have been obtained in some of the private offices and in the board of directors' room. In the latter, for example, two strips of Rambush Annulite (60 milliampere) cove lighting produces a highly pleasing effect of soft light.

Special wiring was installed on

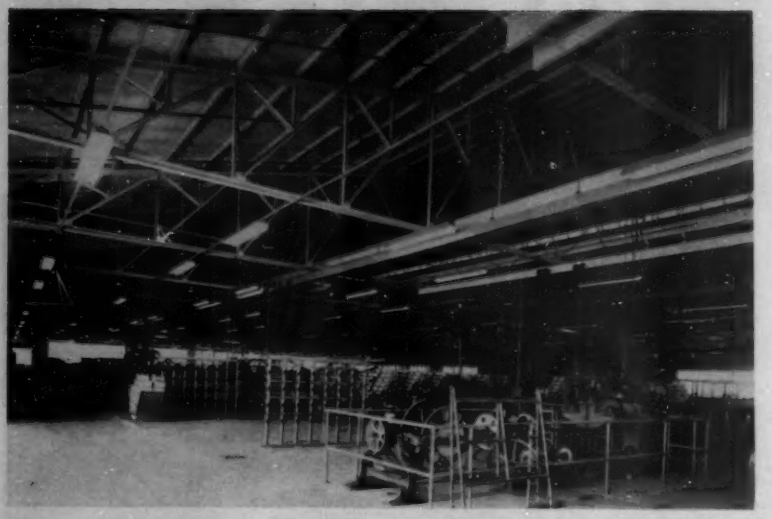
(*Continued on page 82*)



(Above) Circuit breaker-type subpanel is installed on each floor. (Right) Main circuit breaker for the elaborate electrical system is installed in the basement. (Below) Installation of busway in the basement. The Gulf Life Building installation is the most extensive office building electrification job within the experience of the electrical contractor, the Stinson Electric Co., of Jacksonville. Many new ideas were employed in the wiring and lighting to achieve a unique and functional operation for the almost 100 per cent electrified building.

Recent industry development provides versatile installations

New raceway for adequate



Fluorescent lighting fixtures in the manufacturing area of the Edwin H. Fitler Company building are served by Surfaceduct. Fixtures are attached directly to the duct which supplies them with power. More than 10,000 feet of the duct was used in this lighting installation.

Lighting for the machine shop of the Fitler building is also supplied by Surfaceduct-fed fluorescent fixtures. Nearly two miles of the duct were used in this portion of the building. The new installation answers basic lighting requirements of top efficiency and trouble-free operation.

◆ A CAREFULLY PLANNED lighting installation deserves a well-planned wiring system.

With this in mind, owners, architects, builders, and electrical contractors who recently completed a fluorescent lighting installation in a new industrial building at New Orleans, have a wiring system which is, according to the official who supervised the installation, "modern, flexible, and rugged," and which answers the basic requirements of maximum lighting efficiency and trouble-free operation.

New development used

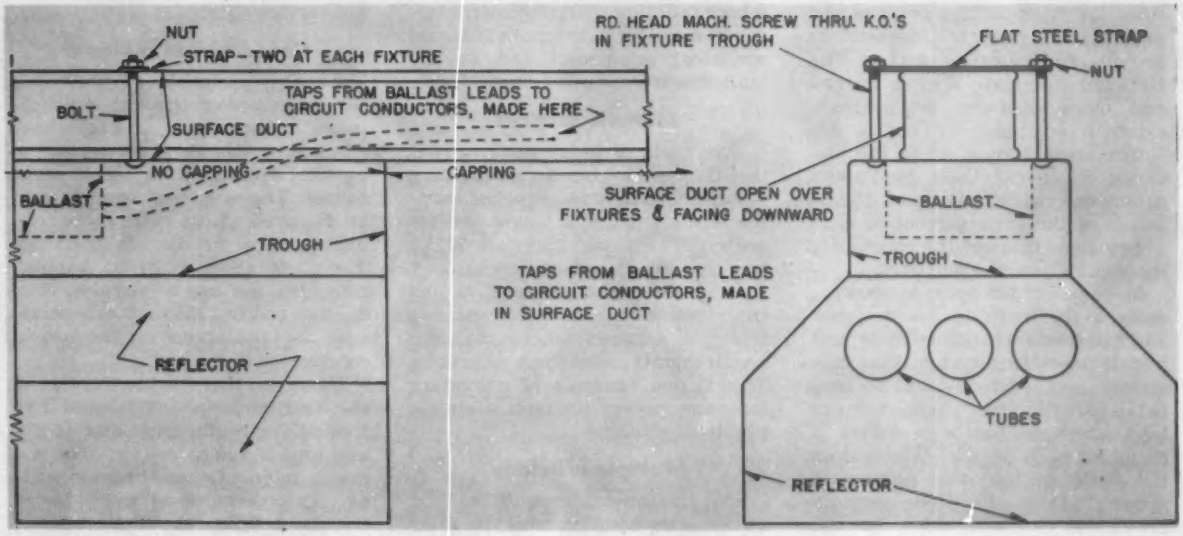
The building, a one-floor plant 440 x 200 feet, was constructed for the Edwin H. Fitler Company of New Orleans, and has a lighting system served by nearly two miles of Surfaceduct metal surface raceway. The Fitler Company manufactures twine and rope in sizes up to the largest in normal commercial and industrial use.

Many lighting engineers point out that most of the existing lighting under which industrial workers do their jobs is far below already recognized and practical illumination standards. Much of the blame for these conditions, they say, can be laid to inadequate wiring. If a wiring system is not designed to provide full rated voltage at ballast lead connections for fluorescent lamps, lighting efficiency suffers. Only when full voltage is applied can a building owner get the amount of light he pays for in energy consumed by the lighting system.

Adequate light sure

All concerned in the construction of the Fitler building have made sure that the owners will be assured adequate lighting. Surfaceduct wiring assured a lighting system which was installed easily,

industrial lighting



This sketch shows how metal surface raceway serves industrial fluorescent lighting fixtures in the Fitler Company, New Orleans. (Right) Front view illustrates the steel strap, nut-and-bolt method of attaching fixtures to the duct. (Left) A side view shows how taps from ballast leads are connected. Suspended from ceiling, raceway carries power to fixtures, acts as a support for fixtures, and for industrial RLM fixtures.

economically, and in a minimum of installation time.

Electrical contractors Gibson & Odom, of New Orleans, have high praise for the metal surface raceway used to service the building's fluorescent lights. Architect Charles T. Main of Boston, had initially specified a wiring system consisting of messenger cables which were to run the length of the building. These cables were to carry short lengths of electrical metallic tubing which would connect the industrial fluorescent fixtures to power lines. But J. F. Kirkpatrick, resident manager of Fitler asked for a change. He had been impressed with the Surfaceduct he had seen in other applications and requested that the architect incorporate the metal surface raceway in plans for his industrial lighting layouts.

Versatile raceway

Surfaceduct, a development of National Electric Products Corporation, of Pittsburgh, is a raceway through which all types of service may be obtained ranging up to 60 amperes. It is well suited to Fitler's present lighting needs and provides for future changes.

Designed specifically for commercial and industrial use, Surfaceduct requires only a few simple fittings for most installations. At the Fitler building, the duct's base is suspended from the roof by means of steel straps fastened to fitted hangers. Conductors are laid in the base and wire-retaining bridges are snapped in. Capping is snapped over the base and is locked in place by the retaining bridges.

Fluorescent fixtures are attached directly to the Surfaceduct base, and taps from ballast leads are connected to conductors carried in the duct. No capping is used on the duct where the fixtures are attached. A steel strap is placed over the base of the duct and bolts from the trough of the fixture fasten the fixture to the Surfaceduct through the strap.

Future planned for

If for any reason future lighting demands require additional fixtures, they can be quickly and easily installed in the same fashion.

This same surface raceway was selected to serve not only the

(*Continued on page* 80)

How the Code provides for

◆ THE NATIONAL ELECTRICAL CODE provides practical wiring regulations for safeguarding persons and property. It does not necessarily provide for adequate wiring. The National Adequate Wiring Bureau and other agencies do properly promote adequacy of wiring for future loads. Nevertheless, the National Electrical Code has many provisions which do lend themselves in the arrangement of wiring systems to meet the constantly increasing use of electricity.

More power ten years hence presents a challenge to the designer and contractor to so arrange and install the wiring system that materials installed today will be useful in carrying their share of future load which, as has been stated, is doubling each decade. Where does the Code fit into this picture of growth? Does the Code contain provisions that will allow for the expansion of wiring systems, or, does the Code retard the expanding needs for wiring capacities? The purpose of this paper is to discuss a few of the regulations of the Code that do allow for the orderly handling of increases in power requirements.

Basic methods

More power can be conveyed over wiring systems by three basic methods: multiplicity of circuits, higher currents, and higher voltages.

The following examples are presented in support of the contention that the Code does contain many provisions for load growth.

The simplest provision is that of space, yet it is frequently overlooked. The Code Introduction under Wiring Layout recommends ample space for equipment for future increases. Space is simple and inexpensive to provide initially, but it can become a costly item where building rearrangements become necessary before additional electrical equipment can be installed.

Multiple services

The loads of today are so great that they cannot be carried in many installations by a single set of service wires and by a single service switch. The Code (Section 2321) has for many years recognized these load limitations and it has contained provisions that permit multiple services where capacity requirements make them desirable. This is one example of providing for more power through a multiplicity of circuits.

Multiple switching

The practical limitations of switch sizes coupled with the vital importance of continuous electrical service many years ago brought about the provision contained in the Code (Section 2351) that more than one service switch may be used at the service. The Code contains the allowance that each set of service-entrance conductors may have not more than six switches or circuit breakers as the service disconnecting means.

Equipment designers have been making increasing use of this principle of multiple service switches recently, and electrical distributors are handling more of these lines of switches which have main switches in parallel. The principle of multiple switching as contained in the Code is sound. It provides for the addition of paths for increased loads. Multiple service switching provides greater safety by not placing dependence upon a single switch which, if failure should occur, could plunge not only the entire premises into darkness but also could stall elevators and cripple all other services simultaneously. It is better engineering to split loads into several paths and supply each part through a separate service switch.

Conductors in multiple

Another example of providing for more power through multiple paths is the use of smaller more efficient conductors connected in parallel compared to single large cables. The waste of copper is to be deplored where extra large conductors are needlessly installed. The Code (Section 3105) has encouraged the use of parallel conductors and in 1953 further liberalized its regulations on the use of conductors in multiple.

However, there is justification in the use of large conductors like 1,000,000 circular mils and larger and that is where voltage drop is a major factor. Other than for voltage drop considerations, 350,000 circular mils is about the economical limit for cables in alternating-current circuits. For example, two No. 250,000 CM conductors with type RH insulation will together carry 510 amperes compared to only 475 amperes for a similar 750,000 CM conductor. This is a 35 per cent saving in copper. A direct benefit to the distributor which comes about by the better use of these cables is the reduction or elimination of the larger sizes of wires which need to be carried in stock.

Higher currents

The 1953 Code has again recognized the capacity of new cables to safely carry higher currents, and the Code (Section 3102) contains provisions for the use of recently improved conductor insulations. These cables can withstand higher temperatures, consequently they can safely carry more current which of course means more power.

Consider, for one example, the moisture and heat resistant wires approved in the 1953 Code (table 1). The 1951 Code limited the cur-

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This article is adapted from Mr. Turnbull's address before the recent convention of the National Association of Electrical Distributors.

wiring modernization

by John M. Turnbull
Director, Area Development Department
Western Massachusetts Electric Co.

rent carrying capacity of such moisture resistant wires on a 60° C basis. Today type RHW—rubber, heat and moisture resistant — is rated at 75° C. What does this mean in increased current carrying capacity? Two years ago, 250,000 CM type RW was rated 215 amperes. Type RHW now has a rating of 255 amperes. This improved in insulation from 60° to 75° C has thus permitted an 18 per cent increase in the current rating of this size of wire. Subsequent codes will likewise follow this established procedure of increasing the ampere ratings of cables upon further improvements in their insulations.

Rewiring of buildings

Most commercial buildings have wiring systems that are quite inadequate for even today's loads, to say little about the power demands which they will be expected to carry ten years hence. What steps have been taken to overcome the crippling bottleneck of conduits that were filled up with wires years ago? The entire replacement of the conduit system is generally too costly. In what ways has the Code (Section 3466) helped to alleviate these conditions where conduits are filled with cables and where the conduits cannot be replaced?

When thinner wires became available, the Code was changed to permit the replacement of the old wires by new thinner wires and also to permit a much greater number of wires to be pulled back into these conduits. The Code provision alone has opened up a vast market for more power.

The Code rules on the rewiring of existing conduits permit a 50 per cent conduit fill compared to only 40 per cent of new work. For example, an old installation having three No. 6 type R wires rated 55 amperes can now be replaced, under the Code rewiring allowances, by three No. 2 type T (or similar-sized wires) rated at 95 amperes. Here is a case of a Code rule allowing for a 75 per cent increase in the capacity of an existing raceway.

Higher voltage systems

The 1953 Code (Section 2113) contains new and additional provisions for the greater use of higher voltage circuits and appliances within buildings. Section 2113 is most significant in its new provisions for fluorescent lighting circuits that are not to exceed 300 volts and which may be installed in industrial plants, commercial premises and large schools. This rule which governs the 277/480 volt system of lighting and power promises substantial economies in the wiring of large structures. The industry can look forward to the wiring of buildings under this new Code regulation which will help greatly to meet the power demands of years ahead.

Incidentally, distributors will recognize this system of voltage from the new wall switches now being carried in their stocks which have the 277-volt rating.

Comparative studies reported in the magazine, Electrical Construction and Maintenance, May 1954, indicate that large office buildings having major motor loads and general area fluorescent lighting can realize savings in excess of $25 per kva of demand (and over 20 cents per foot of rentable floor space) by installing primary 277/480 volt systems. This article cited convincing arguments for high-voltage distribution in commercial structures. Higher voltage wiring will convey more power economically; and this is another example of the Code having kept progress with developments.

Fluorescent lighting

The 1947 Code (Article 410) contained the first set of wiring rules on fluorescent fixtures (Sections 4181-4203) and they have remained practically unchanged. This fact attests to their basic soundness. One of the most important of these fluorescent rules was the safety provision that was built into this new lighting development whereby all equipment such as lampholders would have no exposed live parts. Thus while the Code provided for more power through higher voltage, yet at the same time the safety factor was increased over earlier forms of lighting equipment that had exposed live parts.

Branch circuits

A three-wire 115/230 volt branch circuit is the equivalent of two 115-volt receptacle branch circuits. This is one of the new notes in the 1953 Code (Section 2115). Despite the simplicity of its language, this note portends a trend of the utmost importance — namely, that 230-volt appliances are bound to come into greater use in homes, factories and commercial premises to displace the heavy duty appliances now using 115-volt circuits.

For example, the ¾ hp room air conditioner having a nominal rating of approximately 13 amperes at 115 volts imposes an unduly severe load on the common 15-ampere, 2-wire, 115-volt branch circuit especially if other loads are supplied by the circuit. Where the 3-wire circuit has been made available and such an appliance has been connected for 230-volt operation, the current is cut by one-half to 6½ amperes, and the appliance could be safely operated from such a 15-ampere, 115/230 volt, 3-wire circuit. Twenty-five per cent of the copper is saved by this circuit and improved operations result from the use of this branch circuit. This 3-wire circuit is advocated by the 1953 Code to meet the loads of tomorrow. It will contribute greatly to adequate wiring allowances.

(*Continued on page* 80)

Problems of the textile plant

◆ "PROBLEMS OF A PLANT ELECTRICIAN" is a very broad subject and of course this discussion will have to be confined to just a few of them, as it would require more time than we have here to cover them all. However, we will discuss some of the most common problems today: (1) Proper maintenance of motors, including cleaning, lubrication, overhaul, emergency drying; (2) Maintenance of switches and starters; and (3) Loose connections.

There is no doubt that the polyphase induction motor is the simplest and most foolproof motor built. The largest single cause of winding failures, in my opinion, is due to the rotor rubbing the stator, caused by worn or complete failure of the bearing.

Check air gap

A good maintenance procedure is the periodic checking of the air gap between the rotor and stator with a feeler gauge to detect worn bearings that might permit the rotor to rub the laminations of the stator. A very slight rub will generate sufficient heat to destroy the coil insulation. This will cause a burned out motor, although the motor may have proper protection as far as controls are concerned.

Cleaning is very important in the maintenance schedule. To get best results, there is a necessity for having definite cleaning schedules and following through on them. In some plants, the cleaning is under direct supervision of the electrical department. In others, it is done by the regular mill cleaners.

When the cleaning is not under the supervision of the electrical department, the electrician should continually make spot checks. If the cleaners start getting lax in the motor cleaning, the superintendent or the proper authority should be notified in order that this condition may be corrected. It doesn't take long to cook the insulation in a motor when the air passages get clogged preventing the proper cooling, especially if the motor is running 24 hours a day under full load.

Air cleaning

Cleaning should be done with air that is as dry as practicable and at pressures not in excess of 50 PSI. Care should be taken to blow the motor in such a manner that the dirt will not be driven into the windings or the insulation be blown off the windings. Where oil has worked out around the bearings on to the frame, it should be wiped off with a cloth (not waste), or in severe cases should be washed with mineral spirits, being sure no lint is left around the bearing housing to wick out the lubricant.

In some cases, where the motor is mounted on or near the floor, trouble is experienced by yarn falling to the floor and then being sucked into the end of the motor and winding on the shaft. In this case, the yarn will wind next to the bearing housing, causing enough friction to create heat on the housing, overheating the same, which in turn causes the grease to break down in the bearing. In some cases, the yarn will actually work under the grease seal and lock the balls in the bearing, causing immediate failure.

Neglect of inside

We have eliminated this trouble on one particular type of winder by making a screen of quarter inch mesh hardware cloth to fit over the air intakes on the brackets. This has effectively stopped the yarn from entering the motor. Although this screen covers with lint very quickly, we find that it does not retard the air enough to cause overheating.

The textile type motor has, of course, made it much easier to keep motors clean. However, most of the plants still have a great percentage of the older general purpose motors which were not designed for easy cleaning. If fairly close supervision is not used, the cleaners are prone to blow off the outside of the motors and leave the inside full of lint and dirt where it is not easy to detect. This is where the most damage is done if not kept clean.

Lubrication ranks as one of the most important items of maintenance. A basic knowledge of lubricants and lubrication technique is essential to the proper maintenance of the many types and sizes of the bearings in our electric motors. The lubricant in most motor bearings should be replenished or renewed at regular intervals. This will depend on the type, size and kind of service for each individual case, which can only be determined by regular inspection. Lack of proper oiling and greasing will produce disastrous results to motors.

Lubrication basic

We have found from experience that an excess of oil or grease can be about as bad as too little. Too much oil will get into the windings, causing deterioration of insulation and will also cause dust and lint to to literally stick inside the motor, making it practically impossible to blow it out with air. Excessive grease will also cause ball bearings to heat and in some cases break down the grease, causing the bearing to fail. This makes it necessary to set up a definite schedule and follow it.

Of equal importance is the kind of oil and grease to use. Generally, we can follow the recommendations of the manufacturer or of experienced oil companies. However, at times these recommendations do not hold good due to some unusual condition that arises in various locations of equipment. In these cases, a study will have to be made of the existing conditions and corrections are necessary to suit each case. I have found that,

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These remarks were adapted from Mr. Richardson's address before the "Conference on Electrical Application for the Textile Industry," held recently at the Georgia Institute of Technology.

electrician

by K. A. Richardson
Bibb Manufacturing Company
Macon, Ga.

when one of these problems arises, the oil companies are glad to cooperate in working with us to locate our trouble in order that we may get the proper lubricant for specific applications.

We find that the use of an automatic oiler with clear plastic or glass cups is our best solution for oiling the ring oil bearings. We are able to set the oil level to be maintained at the time of installation and this will remain constant as long as oil is in sight in the cup. This makes it easy to observe whether or not oil needs to be added without a lot of wasted time.

Overhauling motors

When the motor is brought to the shop for overhaul, it should first be blown out with air to remove as much dirt and lint as possible before being disassembled. This is done outside of the shop to keep the shop as clean as is practicable.

The motor is then disassembled in the shop and the various parts are cleaned. If there is an oily condition in the stator, it is first steamed with a detergent solution, then with clear steam until free of all the detergent.

When it is necessary to steam clean the stator, it should be put into the oven immediately to start the drying process and should not be allowed to remain in a wet condition for any length of time, because while cooling after steam cleaning, the moisture will be taken into the coil insulation and will be very difficult to dry out. If the stator is put into the drying oven immediately, the temperature will continue to rise, evaporating the moisture out of the windings without allowing the insulation to absorb any undue amount of moisture before drying.

Baking stators

After steam cleaning, the stator should be baked at a temperature of about 225° to 235° F. until insulation resistance becomes constant. This will usually take eight to twenty-four hours. When the stator is thoroughly dry, it should be taken out of the oven and allowed to cool to within approximately 25° F. of room temperature, then dipped in varnish and allowed to stay until no further bubbling occurs.

All excess varnish should be allowed to drain from the stator before it is put back into the oven. The baking time on most insulating varnishes used for this purpose is approximately eight to ten hours at 235° to 250° F. Of course, the time will vary according to the type drying oven and kind of varnish being used. Manufacturer's recommendations should be followed for the particular type of varnish being used.

After baking, the stator should be cleaned while it is still hot, as the varnish will come off the metal surfaces easily if not allowed to cool and set up hard before starting this work.

Checking rotors

The rotor should be checked with a growler to determine if any of the bars are open. If any of the bars are found to be open, this should be corrected if possible. In some cases, as with rotors that have the bars cast in with the shorting ring as one casting, the only thing that can be done is to replace the rotor; but in the case of most older motors, we find that the bars come loose where they are made up in the shorting ring. There are various ways of correcting this, such as brazing the bar ends to the ring or drilling and using a wedge to expand the bar tightly into the ring.

The bearings, if the sleeve type, should be checked for wear and if beyond the allowable tolerance should be replaced. Ball bearings should be checked very carefully for wear and noise. Noise usually indicates rough balls or race. Of course, any bad bearings should be replaced.

The shaft should be checked both for wear and alignment. A slightly bent shaft can cause as much bearing trouble as any other cause. If the bearing surface is worn as much as the tolerance clearance of the bearing of the same size, in case of the sleeve bearing, the shaft should either be built up or replaced. This, of course, will depend on the condition of the entire shaft. In the case of the ball bearing motor, the shaft should be not more than .0005" under the inner race measurement of the bearing. In other words, if the bearing will slip on the shaft without heating slightly, it is too loose, and if the bearing has to be heated very hot to get it on the shaft, it is too tight.

Fit of bearings

When a ball bearing is put on a shaft too tight, the inner race is either distorted or expanded, causing preloading of the bearing. This, of course, will result in heating and short life of the ball bearing.

The bearing housing for ball bearings should be checked for wear and if worn should be bored out and bushed to the exact size, which, in my opinion, should be .0005" larger than the outer race measurement of the ball bearing being used. It is generally agreed that the ideal fit would be enough clearance to allow the outer race to creep in the housing while the motor is running. This fit is hard to obtain, in fact, if more than .0005" clearance is given, this being a snug push fit, the steady vibration and creepage will wear the cast iron housing until the bearing gets loose enough to start chattering. Once there is enough play, it does not take long to wear beyond all limits.

On one group of motors we have, the manufacturer fitted the ball bearings with enough clearance to allow creepage. This was a good idea and theoretically a good thing, but it did not work out for us in actual practice. A large number of the brackets were replaced by the manufacturer because of wear and chattering and several reasons

(*Continued on page* 78)

An interior view of the Virginia Shoe Company, where heat pumps for year-round air conditioning have proved successful, pictures a line up of a portion of the 17 units used in the building, which houses 300 workers.

Successful application of heat pumps in this small industrial building has indicated new opportunity for the electrical contractor in year-round air conditioning

Heat pumps in industrial plants

by A. M. Raney, Jr.
Commercial Specialist
General Electric Supply Co.
Richmond, Va.

◆ A MULTIPLE installation of Weathertrons in the new plant of the Virginia Shoe Company, Fredericksburg, Va., one of the first installations of its kind, points the way to a new field for the use of heat pumps in industrial applications of year-round air conditioning.

The Virginia Shoe Company is an old, established, locally-owned shoe manufacturing firm formerly located in an outmoded downtown building. They are primarily producers of children's shoes, and decided on a one floor completely modern plant to employ approximately 300 people and step up production to an average of 3,000 pairs per day.

Dealer's sale

Early negotiation through the local General Electric dealer, Fred A. Payne, proved the value of the multiple installation of the Weathertron for this type of operation. Mr. Payne has long been a factor in the heating and air conditioning business in Fredericksburg, and he was responsible for the sale, design and installation of this unusual application. The building itself is of insulated cinder block construction, employing incandescent and fluorescent lighting. The

COMPARE LEV·O·LOCK DEVICES FOR

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COMPARE LEV·O·LOCK DEVICES FOR PERFORMANCE

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COMPARE LEV·O·LOCK DEVICES FOR PRICE

Leviton buys huge quantities of the best in raw materials — then mass produces every component part of every product to precise Leviton standards . . . whether it's small screws or metal plates. The result? LEV-O-LOCK is a truly precise, superior product — at a trim price that defies competition!

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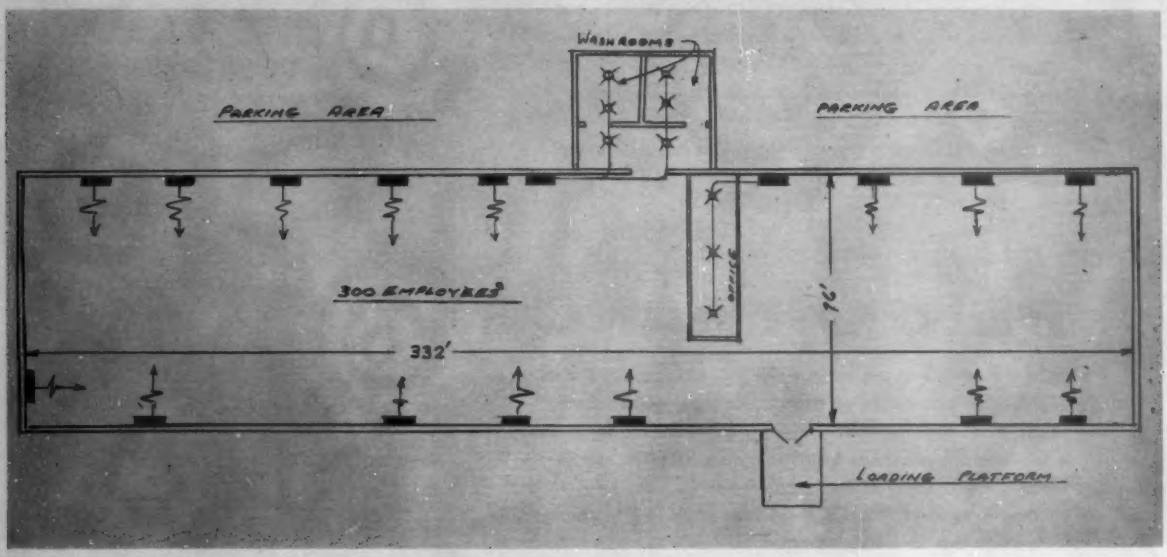

Air intake and exhaust openings are visible in the exterior view of the Virginia Shoe Company building. The diagram indicates location of the Weathertron units which were spaced four or five inches from outside wall.

production and assembly area is 76 ft. x 332 ft.

Certain peculiar characteristics of this type of industry complicated the planning and design for Mr. Payne. In the first place, some 132 fractional horsepower motors are used on the various machines, some 29 kw of resistance heaters for glueing and drying operations are peculiar to this type of industry. A large exhaust air system had to be installed to carry off dust and shavings. In addition the relative humidity in a plant of this type is a critical factor, particularly in the fall and spring where a constant temperature must be achieved while maintaining the same relative humidity.

Reasons for heat pumps

Weathertrons were selected rather than a central conventional type of heating and air conditioning for several reasons. In the first place, it was realized that any physical breakdown of a central plant would result in a costly loss to the owners in labor efficiency and production, whereas the Weathertrons would provide a constant level of comfort. In fact, the installation was designed so that if 3 or 4 units were to be serviced at one time, it would not seriously impair regular production. Also as pointed out above, the characteristics of this type of plant made it particularly adaptable to individual zone control. The Weathertrons, therefore, could be located with individual thermostatic controls to be adjusted as varying production requirements varied from department to department.

From an original cost standpoint it was estimated that the installed cost of the Weathertrons would be considerably less than a conventional heating and air conditioning system. As far as operating cost was concerned they would enjoy a favorable rate of approximately eight mills per kwh which certainly was a most important factor. The local utility estimated an annual cost of heating and air conditioning to be about $2,500, which on the basis of a comparison with a conventional heating and air conditioning system was estimated to result in approximately a 30 per cent saving to the owner.

Temperature study

The air-to-air heat pump system was chosen rather than a water source heat pump to obviate the possibility of any failure due to a drop in the water table or mechanical failure of the water pump required.

(*Continued on page 78*)

"Both management and labor approve the Payroll Savings Plan..."

MEYER KESTNBAUM
President
Hart Schaffner & Marx

"Both management and labor approve the Payroll Savings Plan for the purchase of United States Savings Bonds because it enables loyal American workers to help themselves and their country at the same time. A strong backlog of savings is a stabilizing factor in the economy. It is also an element of comfort and security for the individual because it helps him plan a sound future built on sound money. We at Hart Schaffner & Marx take pride in the fact that we introduced the Payroll Savings Plan in 1940 and that it has been continually in operation since that time."

As president of a company which was among the first to offer its employees an opportunity to build for their future through the systematic investment in U.S. Savings Bonds, Mr. Kestnbaum is well qualified to evaluate the benefits of the Payroll Savings Plan:

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ELECTRICAL SOUTH

Know the law

by Arthur L. H. Street

Sabotage of job liable to penalty

◆ THE PROBLEM: angered because a builder discharged him on a job that involved wiring houses, an electrical subcontractor, who had done his work up to that point faithfully, deliberately miswired a meter box. The miswiring did not create any danger and was corrected at a cost of $30.81. Did the electrician forfeit his right to collect more than $1,000 for work and materials that he had furnished according to contract?

Court's answer: no.

The Municipal Court of Appeals for the District of Columbia said that the law was not so severe as to prevent a contractor from collecting any pay for his work merely because of a slight deliberate breach of contract, where he has faithfully performed the greater part of his work. But, of course, the other party to the contract has a right to deduct from the amount due the guilty contractor or subcontractor such sum as it costs to remedy the defective work. (Shapiro, Inc. v. Bimblich, 101 Atl. 2d 890.)

(Note: Of course, this decision should not encourage any electrical contractor to sabotage his work no matter how good his excuse for being angry at an unreasonable owner. At best, he sticks himself for the cost of correcting the work. At the same time, he runs a possible risk of being heavily penalized, for not every court might take as favorable a view as this.

Wiring contract should be specific

◆ THE PROBLEM: a builder of four houses sublet the wiring to an electrical contractor, on a mutual understanding that the wiring should permit electrical service of 100 amperes. When the work was well under way, the electrician discovered that the builder intended to install five-ton, five-horsepower air-conditioners. The builder refused to agree to an additional allowance to cover the cost of the extra work and materials that would be required to install wiring to carry higher amperage service not contemplated by the subcontract. Was the electrician justified in quitting work and suing for the work done by him?

Court's answer: yes.

The Municipal Court of Appeals, District of Columbia, decided that an electrical contractor puts himself in the clear when he wires a building according to the understanding given him when the contract is made, and is not bound to make independent inquiry as to the electrical requirements of equipment to be installed. (Shapiro, Inc., v. Bimblich, 101 Atl. 2d 890.)

(Note: This case suggests the importance of so wording contracts for wiring to show the precise type of wiring to be installed, to give the other party no excuse for claiming that the electrician obligates himself to provide wiring adapted to some particular use not considered by the parties in making the contract.)

It pays to know lien law of state

◆ ORDINARILY, when an electrical contractor wires a building for the owner, whether as a new installation or repair, the contractor can secure a mechanic's lien against the property, by giving the notice required by the lien law of his state. But he should watch his step when he does the work for a tenant or one who merely holds a contract for deed on the premises.

Among other reasons why caution should be used is that, possibly there is an understanding between the owner of the building and the tenant or contract purchaser, that the wiring may be removed at the end of the lease or on cancellation of the contract for deed. Such an agreement means that the wiring does not become a part of the real estate but remains personal property and therefore is not a proper subject for lien against the real estate.

This discussion is prompted by a decision recently reached by the Connecticut Supreme Court of Errors that is probably in line with what the courts of any state would be apt to decide under a similar state of facts. (Stone v. Rosenfield, 104 Atl. 2d 545.)

Defendants owned a two-family dwelling house to the rear of which was a brick building formerly used as an ice plant. They contracted to sell the entire property to a dry cleaning company at a future date, subject to cancellation if the company became bankrupt, which it did and the contract for sale was cancelled.

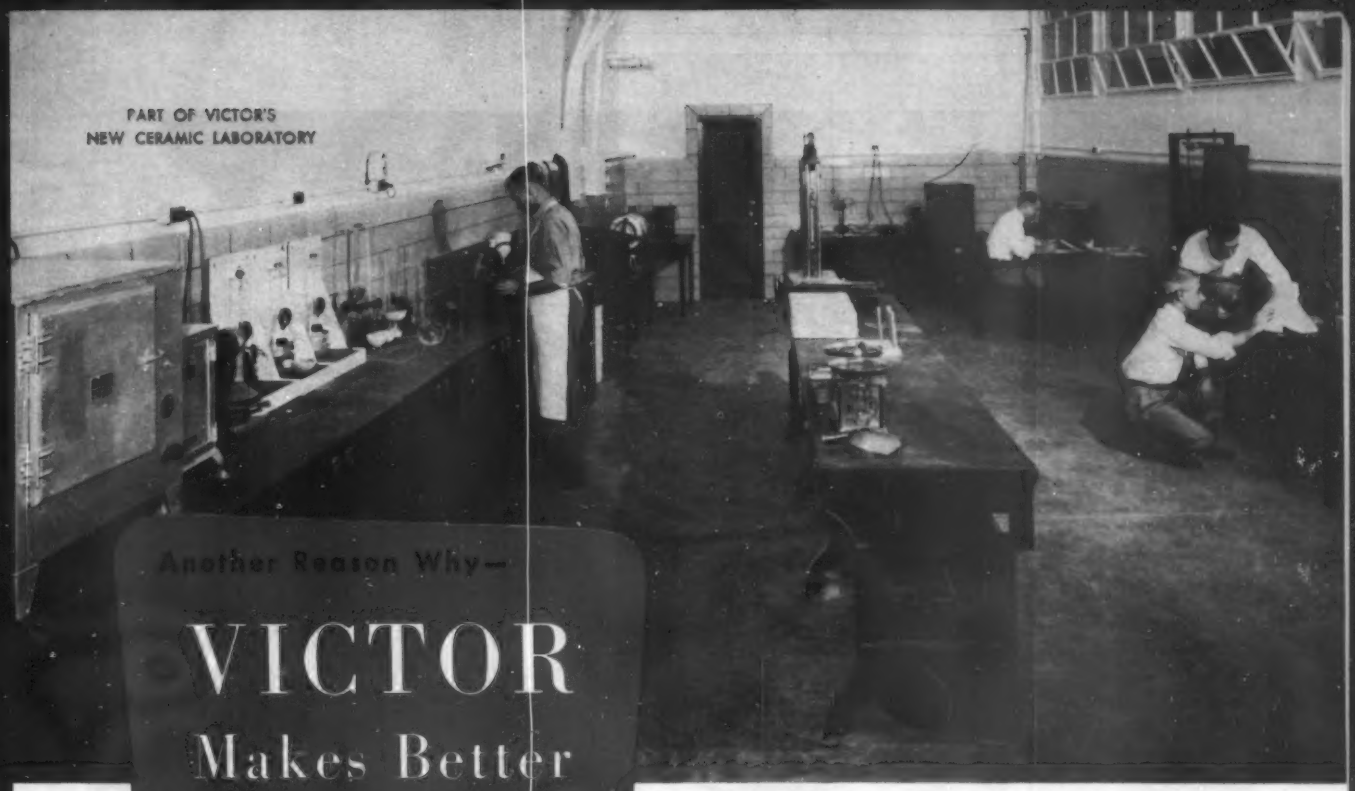
Wiring for cleaning

In the meantime, the cleaning company, with the approval of defendants, employed plaintiff, an electrical contractor, to remove the old wiring in the brick building because it was not usable for the cleaning plant that the company expected to install, and to install new wiring. The work included the placing of conduits and panel boards and breaking through some of the walls, installing lead shields in at least one hole, and placing screws in the shields to support conduits and boxes. The work was intended to be for the sole use of the cleaning company and had no value for any other purpose.

The contractor quit when not paid as the work progressed and attempted to enforce a lien against the premises as security for the payment of a balance due for work already done.

The court decided that the facts were such that the contractor knew, or ought to have known, that the wiring was not intended by the owners of the building and the cleaning company to constitute a *permanent* improvement of the property, unless the company should become owners under the contract for deed, which it did not. Therefore, right to a lien was denied by the court. This left the contractor with no means of forcing payment for the balance due him, the company having become bankrupt. One of the defendants had promised that he would see that the contractor was paid, but this promise seems to have been in the nature of an oral guaranty, which was not enforceable.

How could and should the contractor have protected himself? By refusing to do the work until and unless one or more solvent persons signed a written guaranty that the work would be paid for.



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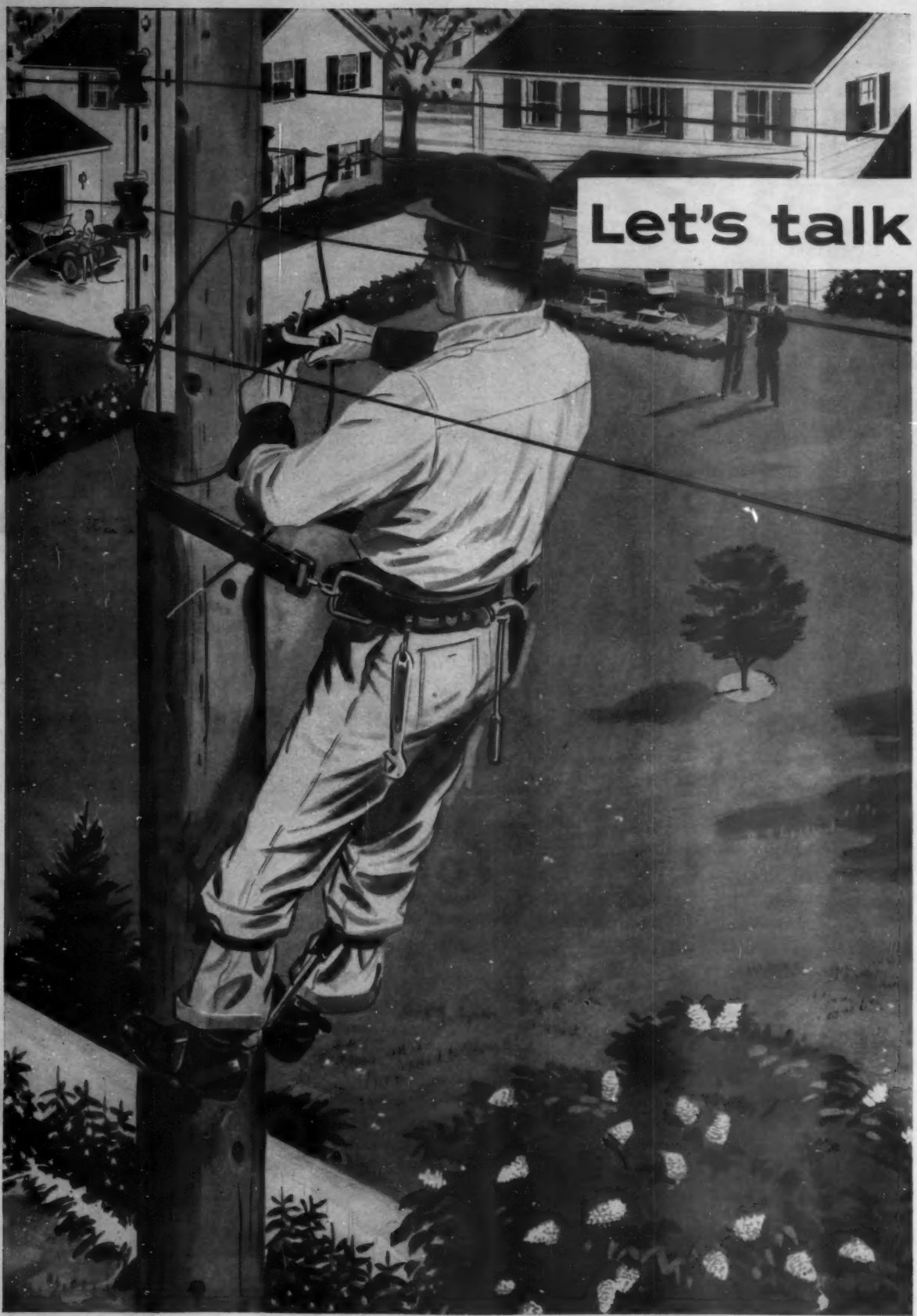
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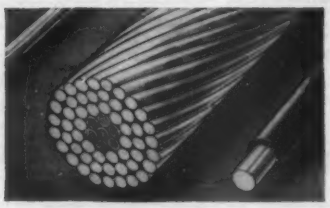
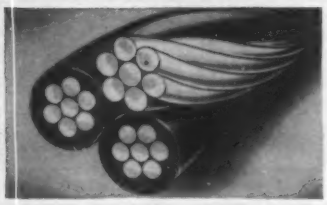


Covered Wire and Service Drop



Accessories for All Conductors

ESTIMATING FORMS

AN IMPORTANT PHASE of the estimating process is that of listing the various materials and components that will be required to complete the job. From these lists, the cost of the materials and the number of labor units required to install them may be determined, and these become the basis for the estimates.

These detailed "take-offs" may be handled in several different ways, and to some extent the most convenient and efficient method will depend upon the nature of the construction work. In almost every case, however, the estimator will find it advantageous to use a standard form, or series of forms, for recording the information taken from the construction drawings.

Some estimators are individualists and prepare their own forms, but by far the greater number make use of forms that are regularly available from several sources. One of these sources is the **National Electrical Contractors Association,** but since its forms are available only to members, and are not otherwise available, they will not be discussed here.

Excellent take-off forms, scientifically designed, are available from the **Chicago Electrical Estimators Association,** 228 No. LaSalle St., Room 1600, Chicago 1, Ill. Six different types of forms are available in pads of 50 at very nominal prices.

Form 1 is designed to serve as a title or record sheet for the estimate. It includes spaces for complete data identifying the job and principals, as well as an index to specification requirements that affect the electrical subcontract.

Form 2 is an Outlet and Circuit Schedule, especially designed for large jobs. The sheets contain an ample number of columns without headings so that the various units involved may be indicated and then listed by floors.

Form 3 is a Feeder Schedule, also designed for large jobs. It includes such headings as "Feeder No.," "Distance," "Wire-No. & Size," "From," "To," and "Load," with numerous columns without headings for special listings.

Form 4 is a Pricing Sheet and contains columns listing both material quantities and costs as well as labor units involved and extension of totals.

Form 5 is the Summary Sheet. This is a particularly comprehensive form and contains well designed spaces and headings in which to record totals on outlet data, total load data, material, labor and total costs for specific portions of the job, and a valuable list of incidental costs, non-productive labor, and a bid calculation form with space for material, labor and total costs, per cent overhead, net cost, per cent profit, and selling price.

Form 6 fills the need for an Outlet, Circuit and Feeder Schedule for small jobs, and contains suitable columns for recording this data on one sheet. It would replace Forms 2 and 3 on smaller jobs.

ANCHORS LAG SCREW SHIELDS
IN BRICK (BY POWER)

BOLT SIZE	HRS. EA.	LABOR COST INSTALLED AT FOLLOWING RATES EACH											
		$1.25	$1.50	$1.75	$2.00	$2.25	$2.50	$2.75	$3.00	$3.25	$3.50	$3.75
3/16"	.15	.19	.23	.26	.30	.34	.38	.41	.45	.49	.53	.56
1/4"	.2	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75
5/16"	.2	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75
3/8"	.2	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75
1/2"	.25	.31	.38	.44	.50	.56	.63	.69	.75	.81	.88	.94
5/8"	.3	.38	.45	.53	.60	.68	.75	.83	.90	.98	1.05	1.13
3/4"	.35	.44	.53	.61	.70	.79	.88	.96	1.05	1.14	1.23	1.31
7/8"	.45	.56	.68	.79	.90	1.01	1.13	1.24	1.35	1.46	1.58	1.69
1	.55	.69	.83	.96	1.10	1.24	1.38	1.51	1.65	1.79	1.93	2.06
1-1/4"												
IN CONCRETE (BY POWER)												
3/16"	.15	.19	.23	.26	.30	.34	.37	.41	.45	.49	.53	.56
1/4"	.2	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75
5/16"	.2	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75
3/8"	.25	.31	.38	.44	.50	.56	.63	.69	.75	.81	.88	.94
1/2"	.3	.38	.45	.53	.60	.68	.75	.83	.90	.98	1.05	1.13
5/8"	.35	.44	.53	.61	.70	.79	.88	.96	1.05	1.14	1.23	1.31
3/4"	.45	.56	.68	.79	.90	1.01	1.00	1.10	1.20	1.30	1.40	1.50
7/8"	.55	.69	.83	.96	1.10	1.24	1.13	1.24	1.35	1.46	1.58	1.69
1-1/4"	.7	.88	1.05	1.23	1.40	1.58	1.38	1.51	1.65	1.79	1.93	2.06
							1.75	1.93	2.10	2.28	2.45	2.63

NOTE: ABOVE FIGURES BASED ON INTERMITTENT OPERATION.
LABOR: INCLUDES PREPARATION, LOSS TIME, DRILLING, SETTING AND SECURING BOLT.

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A new Hot Spray System now used by Allis-Chalmers effectively substitutes heat for solvents in painting, to produce a higher quality finish than conventional spray processes. A smoother surface is achieved with a uniform coating that offers greater resistance to contamination and corrosive action. Pole type distribution transformers in ratings through 50 kva get this new surface treatment.

Paint Heated to 160 F

The fact that cold paint is thicker than paint kept at normal room temperature is widely recognized — cold paint takes more solvent to make it flow and atomize. In the new Allis-Chalmers hot spray process, alkyd-resinous paint is heated to 160 F. Only 15% solvent is required, compared to the 40% solvent needed in conventional spraying at normal temperatures. Since there is far less solvent to evaporate, shrinkage after the paint is applied is greatly reduced. And better filling properties, brought about by improved flow and atomization, result in a smoother surface with greater gloss and excellent coverage.

Tests Prove Value

Tests conducted at Allis-Chalmers and at the Sub-Tropical Testing Laboratories at Miami, Florida show conclusively that tanks first cleansed and treated by Spra-Bonderizing and then Hot Spray painted have a superior protective surface. Test conditions included salt spray, humidity and sunlight as well as industrial atmosphere.

For more information on Allis-Chalmers new hot spray system as applied to distribution transformers, contact your nearby A-C district office or write Allis-Chalmers, Milwaukee 1, Wisconsin. A-4201

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CONDUIT IN VERTICAL SHAFTS
THINWALL ON CONCRETE.

COND. SIZE	HRS. "C"	LABOR COST INSTALLED PER FT. AT FOLLOWING RATES										
		$1.25	$1.50	$1.75	$2.00	$2.25	$2.50	$2.75	$3.00	$3.25	$3.50	$3.75
1/2"	4.8	.06	.072	.084	.096	.108	.12	.132	.144	.156	.168	.18
3/4"	5.2	.065	.078	.091	.104	.117	.13	.143	.156	.169	.182	.195
1"	6.1	.0763	.0915	.1068	.122	.1373	.1525	.1678	.183	.1983	.2135	.2288
1 1/4"	8.4	.105	.126	.147	.168	.189	.21	.231	.252	.273	.294	.315
1 1/2"	10.4	.13	.156	.182	.208	.234	.26	.286	.312	.338	.364	.39
2"	13.2	.165	.198	.231	.264	.297	.33	.363	.396	.429	.462	.495
		RIGID ON CONCRETE										
1/2"	5.2	.065	.078	.091	.104	.117	.13	.143	.156	.169	.182	.195
3/4"	5.7	.0713	.0855	.0998	.114	.1283	.1425	.1568	.171	.1853	.1995	.2138
1"	6.6	.0825	.099	.1155	.132	.1485	.165	.1815	.198	.2145	.231	.2475
1 1/4"	9.1	.1138	.1365	.1593	.182	.2048	.2275	.2503	.273	.2958	.3185	.3413
1 1/2"	11.3	.1413	.1695	.1978	.226	.2543	.2825	.3108	.339	.3673	.3955	.4238
2"	14.3	.1788	.2145	.2503	.286	.3218	.3575	.3933	.429	.4648	.501	.5363
2 1/2"	18.2	.2275	.273	.3185	.364	.4095	.455	.50	.546	.5915	.637	.6825
3"	24.0	.30	.36	.42	.48	.54	.60	.66	.72	.78	.84	.90
4"	37.2	.465	.558	.651	.744	.837	.93	1.023	1.116	1.209	1.302	1.395
5"	61.4	.7675	.921	1.075	1.228	1.382	1.535	1.689	1.842	1.996	2.149	2.303
6"	86.6	1.083	1.299	1.516	1.732	1.949	2.165	2.382	2.598	2.815	3.031	3.248

LABOR: INCLUDES INSTALLATION OF CONDUIT, SECURING, AND CONNECTING TO BOXES (NO WIRE OR TAPS).
CONDITION: OPENING TO ALL FLOORS.

SWITCHES MAIN DISCONNECT "AC"
STD. ENCLOSURE - 3 WIRE - SINGLE OR THREE PHASE

NEW WORK

AMP. SIZE	HRS. EA.	LABOR COST INSTALLED EACH AT FOLLOWING RATES										
		$1.25	$1.50	$1.75	$2.00	$2.25	$2.50	$2.75	$3.00	$3.25	$3.50	$3.75
30	1.9	2.38	2.85	3.33	3.80	4.28	4.75	5.23	5.70	6.18	6.65	7.13
60	2.4	3.00	3.60	4.20	4.80	5.40	6.00	6.60	7.20	7.80	8.40	9.00
100	4.2	5.25	6.30	7.35	8.40	9.45	10.50	11.55	12.60	13.65	14.70	15.75
200	6.5	8.13	9.75	11.38	13.00	14.63	16.25	17.88	19.50	21.13	22.75	24.38
400	8.5	10.63	12.75	14.88	17.00	19.13	21.25	23.38	25.50	27.63	29.75	31.88
600	12.7	15.88	19.05	22.23	25.40	28.58	31.75	34.93	38.10	41.28	44.45	47.63
REWORK JOBS												
30	2.5	3.13	3.75	4.38	5.00	5.63	6.25	6.88	7.50	8.13	8.75	9.38
60	3.0	3.75	4.50	5.25	6.00	6.75	7.50	8.25	9.00	9.75	10.50	11.25
100	5.3	6.63	7.95	9.28	10.60	11.93	13.25	14.58	15.90	17.23	18.55	19.88
200	8.1	10.13	12.15	14.18	16.20	18.23	20.25	22.28	24.30	26.33	28.35	30.38
400	10.6	13.25	15.90	18.55	21.20	23.85	26.50	29.15	31.80	34.45	37.10	39.75
600	16.2	20.25	24.30	28.35	32.40	36.45	40.50	44.55	48.60	52.65	56.70	60.75

LABOR: INCLUDES MOUNTING SWITCH AND CONNECTING ALL CONDUCTORS, MOUNTED ON WOOD.

Electrical Estimating—III

Estimating tabulations published by special permission from "Blue Book of Electrical Estimating," published by Estimating Handbooks Associates, DeKalb, Illinois. Copyright 1953 by Geo. L. Sherlock.

News of the industry

edited for Southern readers

Industry will observe National Electrical Week

B. A. MacDonald, president of the International Association of Electrical Inspectors, has announced that the electric industry will observe National Electrical Week in conjunction with Light's Diamond Jubilee celebration during the third week of October. The objectives will be to emphasize the safe use of electricity by adequate wiring installations properly designed to assure the public of maximum benefits.

Herbert E. Cook, executive secretary of the Detroit Electrical Association, was named national chairman. R. E. Ward, Nashville, Tenn., was named chairman of the Southern section.

Inspectors groups and electrical associations from all over the country will initiate their own local programs designed to tell the electrical story.

Mr. MacDonald sounded the keynote of the Electrical Week when he said, "This first observance of National Electrical Week will be a co-operative program of all branches of the electrical industry. Its members—a million strong—will bring to all users of electricity the beneficial story of electric living."

The slogan adopted for the national program is "Do It Better, Do It Electrically."

19th IAEL conference set for Philadelphia

The 19th Annual Conference of the International Association of Electrical Leagues will be held at the Bellevue - Stratford Hotel, Philadelphia, Pa. The dates are September 29 to October 2, 1954, inclusive. The first three days will be devoted to general sessions and the last day to the business affairs of the organization.

President Albert L. Maillard, president and managing director, Electric League of Indianapolis, has appointed a program committee under the chairmanship of H. E. Cook, executive secretary, the Electrical Association of Detroit.

The program will include subjects of interest to all branches of the electrical industry which can best be advanced by co-operative methods. Among them will be those bearing on legal aspects of trade association work; room air-conditioners; rewiring of homes; certified lighting; trade educational programs; electric home space heating; industrial educational courses; electrical equipment and production on the farm; and others.

All members of the electrical industry interested in work undertaken co-operatively by League and other similar local bodies are cordially invited to attend the Conference and participate in the discussions, according to O. C. Small, corresponding secretary of the group.

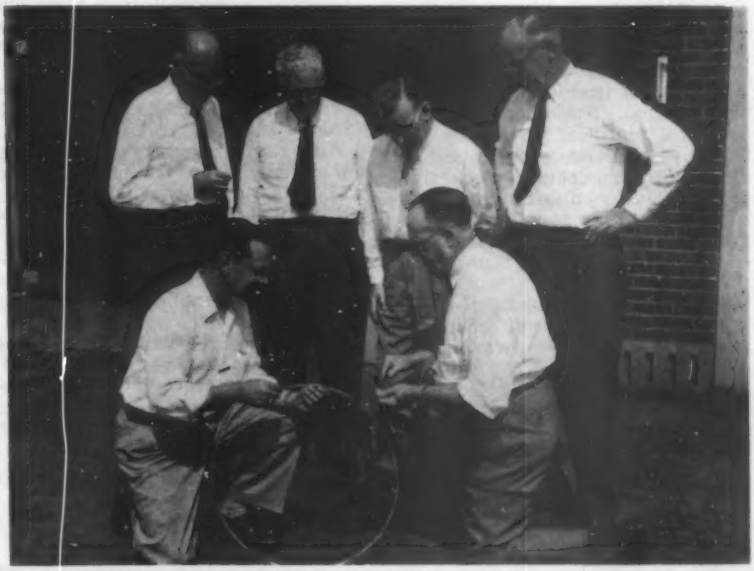
IES announces program for Technical Conference

Papers ranging from basic theories of light and vision through many of the application fields will be presented before the National Technical Conference of the Illuminating Engineering Society, September 13-17, at the Chalfonte Haddon Hall Hotel, in Atlantic City.

The living environment in its acoustic, thermal and luminous aspects will be discussed by three outstanding specialists at the opening technical session Monday afternoon, September 13. The speakers are R. B. Newman of Cambridge, Mass., N. Glickman of Miami Beach, Fla., and L. C. Kalff, Eindoven, Holland.

Five sessions of the conference will be devoted to basic engineering information in the illumination field and lighting applications. These include light sources and controls, lighting calculations, street lighting, and work area lighting; special applications as in church and decorative lighting will also be discussed.

Two outstanding light and vision specialists will present reports on current standards of quality and quantity for interior illumination.



SHIRTSLEEVE SESSION — This shirtsleeve plant session during the recent two-day meeting of American Chain & Cable Company executives and Page Steel & Wire Division sales managers in Pittsburgh shows Bernard Westerman, chief metallurgist, left foreground, explaining the properties of ACCO aluminized wire to E. B. Brant, product manager, aluminized wire sales. Interested onlookers at top, left to right, are C. N. Johns, ACCO president; Harvey W. Seymour, Monnessen plant manager; E. J. Williams, vice-president in charge of operations; and W. H. Bleecker, Page Division sales manager. John Cassidy, Houston district manager, and John Filbert, Atlanta district manager, not shown, also participated in the annual meeting and plant tour.

These standards which form the basis for all modern recommended and standard practices in lighting application will be discussed by Dr. H. R. Blackwell, of the University of Michigan, and Dr. S. K. Guth, director of lighting research, General Electric Co., Cleveland. Dr. Guth is chairman of the I.E.S. Committee on Standards of Quality and Quantity.

Residence Lighting will be featured at the Wednesday morning session when the chairman of the Residence Lighting Forums, Mrs. Katherine T. Goodall, of the Philadelphia Electric Co., presides at the Forum session. Tuesday morning there will also be a session of technical papers including an analysis of twelve solutions to a home lighting problem, and a presentation on home lighting and home decoration by C. Eugene Stephenson, of New York, president of the American Institute of Decorators.

A report of lighting progress will be a principal event of the conference, presented on Tuesday evening by the chairman of the society's Progress Committee, Eugene Beggs, of Westinghouse Electric Corp. This annual report reviews all of the advances during 1953-54 in light sources and equipment and their applications.

Ten regional winners will describe "My Most Interesting Lighting Installation" repeating their presentations which won them a place in the national competition from among some 200 in the local competitions throughout the U.S.A. and Canada. These ten will compete for national prizes on the basis of interest, application of engineering principles, effectiveness of solution, originality of technique as well as presentation. The competition session Thursday morning September 16 is under the direction of the chairman of the Lighting Service Committee, Lee E. Tayler, of the Detroit Edison Co.

President A. H. Manwaring, executive vice-president of Philadelphia Electrical & Mfg. Co., completing his term of office in September, will present his report at the opening session, Monday morning. President-elect Ducan M. Jones, Eastern Canada Representative of Curtis Lighting Co. of Canada Ltd., Montreal, will be presented to the delegates at the Society's annual banquet on Thursday evening.

Nunez elected to head South Louisiana group

ELECTION of John M. Nunez as president of the South Louisiana Chapter, Inc., National Electrical Contractors Association, New Orleans, La., was announced recently.

Other officers elected are Fred Lindsey, vice-president; R. C. Pflueger, Jr., treasurer; Rudolph Viener, Jr., secretary-manager, and Michael Elgutter, assistant manager.

Directors named are Dan Duvoisin, B. A. Wilson, C. H. Appel, Sr., and A. G. Siegel.

Harry W. Mentrup was named to the board of directors.

Electronics group plans 10th annual conference

THE TENTH ANNUAL National Electronics Conference will convene October 4, 5, and 6, 1954, at the Hotel Sherman, Chicago, Ill.

The technical program offers 88 papers covering a broad field of electronic research, development and industrial application and is supplemented by over 160 booth exhibits by manufacturers foremost in the electronics field.

On the social side, the Conference will sponsor three luncheons featuring prominent speakers, an informal evening banquet, and a full three-day social program for the ladies. The Tenth Anniversary of the Conference will be celebrated at one of the luncheons and at the banquet.

The Conference is sponsored by the American Institute of Electrical Engineers, Illinois Institute of Technology, Institute of Radio Engineers, Northwestern University and the University of Illinois, with Michigan State College, Purdue University, University of Michigan, University of Wisconsin, the Radio-Electronics-Television Manufacturers Association and the Society of Motion Picture and Television Engineers participating.

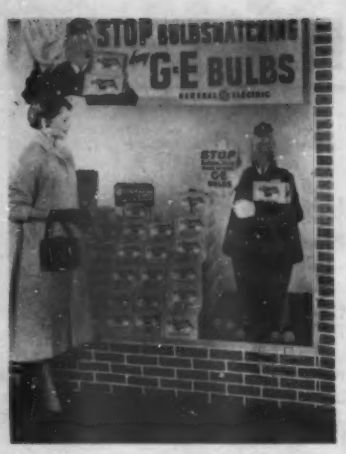
The president of this year's Conference is Dr. R. M. Soria, of the American Phenolic Corp., Chicago, Ill.

Advance registration for the Conference may be made by writing to the National Electronics Conference, Inc., John S. Powers, executive secretary, 84 E. Randolph St., Chicago, 1, Ill.

General Electric sets 'Fall Bulbsnatcher Blitz'

THE 1954 "Fall Bulbsnatcher Blitz," a comprehensive and concentrated retail merchandising activity promoted coast to coast by General Electric's Lamp Division, gets underway October 1

Slogan for the nationwide blitz promotion is: "STOP Bulbsnatching. Buy G-E Bulbs." This admonition is personified pictorially by a colorful "cop," who appears



A comely shopper is shown being stopped by General Electric's "cop" and one of the planned "Fall Bulbsnatcher Blitz" window displays.

prominently in the various window and store display pieces devised by G-E, in streamers and in die-cut cards. In the largest key display piece, Mr. Policeman is featured almost life size.

The likeable "cop," having stopped the passerby in his tracks with one of his huge white-gloved hands, stands ready at the same time to accommodate him with a bright carton of household light bulbs. Additional merchandising helps being made available also carry out the "cop" motif right up to attractive cop-caps for supermarket and dealer sales personnel.

The anti-bulbsnatcher "cop" is also featured prominently in trade paper advertising scheduled in a wide selection of magazines during August and September. The blitz's consumer advertising in the Saturday Evening Post and Life in October are livened with cartoons by George Price, widely known illustrator. Portions of G-E's Jane Froman TV shows on September 30, October 7 and 14 are also given over to the bulbsnatcher crusade. Radio is employed for spot commercials in key cities not covered by TV.

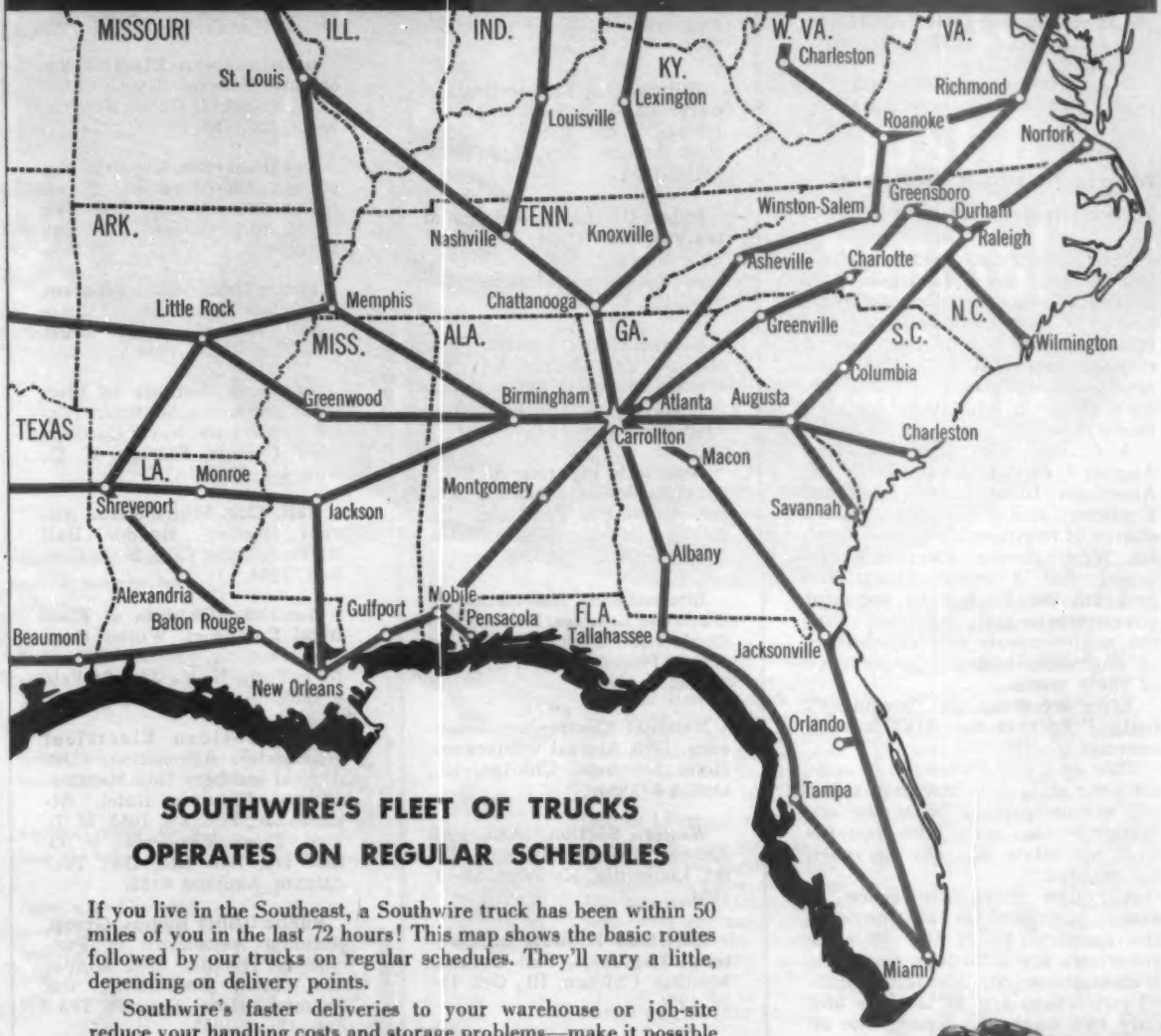
Local prize contests, built around the blitz's bulbsnatcher theme, are being planned by Sales Districts of G-E Lamp Division to spark the fall blitz locally.

New Georgia IAEI officers elected

CODE DISCUSSIONS highlighted the recent meeting in Griffin, Ga., of the Georgia Chapter, International Association of Electrical Inspectors.

Officers elected to serve the group during the coming year are

Southwire MEANS SERVICE



SOUTHWIRE'S FLEET OF TRUCKS OPERATES ON REGULAR SCHEDULES

If you live in the Southeast, a Southwire truck has been within 50 miles of you in the last 72 hours! This map shows the basic routes followed by our trucks on regular schedules. They'll vary a little, depending on delivery points.

Southwire's faster deliveries to your warehouse or job-site reduce your handling costs and storage problems—make it possible to hold inventories at a minimum. Add the high quality of Southwire products to this superlative service and you have a combination hard to beat. Try us and see!

- Southwire Service assures prompt delivery from the South's largest stocks; emergency deliveries in 36 hours or less; individual attention to every order; courteous, experienced drivers with years of cable-handling experience.

Southwire Company

PHONE LD 1500 CARROLLTON, GEORGIA

SOUTHWIRE PRODUCTS

- Bare and Weatherproof Copper
- Neoprene Copper and Triplex
- Copperweld® Conductors
- Steel Strand
- ACSR and All Aluminum
- Neoprene Aluminum, ACSR, and Triplex
- Cable Accessories and Preformed Products

E. Sheldon Gates, electrical inspector of Columbus, Ga., chairman; Carl T. James, electrical inspector of Waycross, Ga., vice-chairman; and Walter S. Smith, Jr., secretary-treasurer.

Board members elected are H. H. Schomburg, H. A. Mason, R. L. Crawford, H. H. Buckalew, and R. M. Ballard.

The membership selected Columbus as the 1955 meeting site.

Monteith urges engineers strive for greater role

THE NATION'S ENGINEERS are doing fine with the slide rule but are permitting themselves to be overlooked when government and business seek to fill positions of management and leadership, the newly-elected leader of the country's electrical engineers declared recently.

A. C. Monteith, who took office August 1 as new president of the American Institute of Electrical Engineers and is vice-president in charge of engineering and research for Westinghouse Electric Corp., urged that a broad educational program be started to acquaint government and business with the achievements and capabilities of engineers and the importance of their work.

After accepting the "president's badge," he told the AIEE annual summer meeting:

"We do a wonderful job of running the slide rule but only a fair job of interpreting what we are doing to the man who benefits from our labor. We take too much for granted."

Although there are twice as many engineers as attorneys in the country, 28 of the 48 state governors are attorneys and none is an engineer, Mr. Monteith pointed out. There are 53 lawyers and only two engineers among the 96 U. S. Senators.

"Yet here are men who are responsible for the spending of billions of dollars for national defense and for improvement of our standard of living," he said. "These men deal daily with the fruits of engineering accomplishments.

"At times we wonder whether we can measure up, but when we see men such as Charles Wilson, now Secretary of Defense, and Senator Flanders making outstanding contributions to this country, we gain confidence and should strive to place more engineers in these responsible positions."

This broad educational program is but one of two "areas that need our concentrated attention," the AIEE president told his audience. The other, he said, is to press for

Dates Ahead

Southeastern Electric Exchange, Personnel Administration Section, Grove Park Inn, Asheville, N. C., Aug. 19-20, 1954.

Illuminating Engineering Society, National Technical Conference, Chalfonte - Haddon Hall, Atlantic City, N. J., Sept. 13-17, 1954.

Public Utilities Association of the Virginias, Thirty-Sixth Annual Meeting, Sept. 16-18, 1954. The Greenbrier, White Sulphur Springs, W. Va.

Southeastern Electric Exchange, Engineering and Operation Section, Thomas Jefferson Hotel, Birmingham, Ala., Sept. 23-24, 1954.

American Institute of Electrical Engineers, Electrical Conference of the Petroleum Industry, Mayo Hotel, Tulsa, Okla., Sept. 27-29, 1954.

International Association of Electrical Leagues, 19th Annual Conference, Bellevue-Stratford Hotel, Philadelphia, Pa., Sept. 29-Oct. 2, 1954.

National Electronics Conference, 10th Annual Conference, Hotel Sherman, Chicago, Ill., Oct. 4-6, 1954.

Western Section, IAEI, 50th Annual Meeting, Seelbach Hotel, Louisville, Ky., Oct. 11-13, 1954.

American Institute of Electrical Engineers, Fall General Meeting, Chicago, Ill., Oct. 11-15, 1954.

Oklahoma Utilities Association, Electric Light and Power Division, Western District Meeting, Duncan, Okla., Oct. 21, 1954; Eastern District Meeting, Ada, Okla., Oct. 22, 1954.

Florida Chapter, IAEI, Joint Meeting with Southern Section, Tampa Terrace Hotel, Tampa, Fla., Oct. 25-27, 1954.

Southern Section, IAEI, Tampa Terrace Hotel, Tampa, Fla., Oct. 25-27, 1954. Conference chairman, R. A. Miller, Tampa.

National Electrical Contractors Association, Annual Convention, Jung Hotel, New Orleans, La., Oct. 27-30, 1954.

Southeastern Electric Exchange, Accounting Section, Roanoke Hotel, Roanoke, Va., Oct. 28-29, 1954.

Southeastern Electric Exchange, General Sales Conference, Roosevelt Hotel, New Orleans, La., Oct. 28-30, 1954.

Southeastern Electric Exchange, Employee and Public Information Section, Roosevelt Hotel, New Orleans, La., Oct. 28, 1954.

Public Information Program, Workshop Conference, Chase Park Plaza Hotel, St. Louis, Mo., Oct. 28-29, 1954.

American Institute of Electrical Engineers, Southern Textile Conference, North Carolina State College, Raleigh, N. C., Nov. 4-5, 1954.

Natl. Elec. Mfgrs. Assn., Annual Meeting, Haddon Hall Hotel, Atlantic City, N. J., Nov. 8-11, 1954.

American Institute of Electrical Engineers, Winter General Meeting, Hotel Statler, New York, N. Y., Jan. 31-Feb. 4, 1955.

Southeastern Electrical Wholesalers Association, Fifth Annual Industry Day Meeting, Atlanta Biltmore Hotel, Atlanta, Ga., Feb. 2-4, 1955. M. L. Tice, Exec. Vice-Pres., P. O. Box 176, Ben Hill, Ga., Tel.: Atlanta Amherst 6182.

Public Utility Buyers' Group, National Association of Purchasing Agents, 24th annual Mid-Winter Conference, the Shamrock Hotel, Houston, Tex., Feb. 13-15, 1955.

Southern Safety Conference and Exposition, Jung Hotel, New Orleans, La., Feb. 27-28, March 1, 1955. W. L. Groth, Exec. Dir., P. O. Box 8927, Richmond 25, Va.

Oklahoma Utilities Association, Annual Convention, Mayo Hotel, Tulsa, Okla., March 24-25, 1955.

American Institute of Electrical Engineers, Southern District Meeting, St. Petersburg, Fla., April 13-15, 1955.

American Institute of Electrical Engineers, Electric Heating Conference, LaSalle Hotel, Chicago, May 10-11, 1955.

It takes just a handful

OF T&B LOCK-TITE CONNECTORS

to tap . . . terminate . . . or splice
on all your jobs

1 Easy installation using only a standard key wrench.

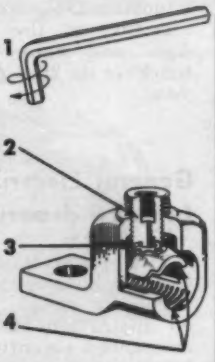
2 Fitting operates on screw-and-saddle principle.

3 Built-in lock washer keeps fitting tight.

4 Serrated saddle and body for better grip.

5 Force applied here is greatly multiplied by leverage screw . . . gives tight all-around grip on cable.

6 T & B designed saddle securely holds large cables or small cables of all types.



T & B Lock-Tite fittings are engineered for long service . . . they cost you less to install—be sure to use them on your next job.

LOOK FOR THIS SIGN—

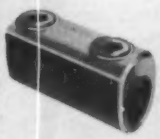
AUTHORIZED DISTRIBUTOR T&B ENGINEERED

LOCK-TITE LUG

One-piece design holds all kinds of conductors: solid, stranded flexible, extra flexible, hemp core, rod, and tubing. Uniform all-around pressure means high conductivity. Only 7 sizes handle all cables from #4 solid to 1000 MCM.

LOCK-TITE TEE-PARALLEL TAP

A versatile, one-piece fitting for use as a tee, parallel, elbow, crossover, two-way, or reducing connector. Hinged top hooks over the "main"...lower opening holds the "branch". Only 13 sizes connect all combinations of "main" cable (1/0 to 1000 MCM) to "branch" cables (#2 to 1000 MCM).



LOCK-TITE TWO-WAY CONNECTORS

Neat and smoothly-rounded fittings for end-to-end connections. Cables are held by individual overlapping, serrated saddles. Each connector takes several cable sizes—you can use it as a reducer. The completed joint is small, streamlined, easy to tape. Only seven sizes handle all cables from #4 solid to 1000 MCM.

TWO other handy, T & B pressure connectors

HINJON JUNIOR TEE-PARALLEL TAPS

Compact, one-piece connector taps small branches to large mains. Self-adjusting jaws grip main and branch cables all around. To make a tee tap, just bend the branch wire at right angles. Installed easily with only a screw driver. Twelve sizes connect all combinations of "main" cables (#8 to 1000 MCM) to "branch" wires (#14 to #1).

LOGITS—Quickly installed terminals for small cables. Double thickness at the thread locks the screw in place. Copper tongue is serrated for positive grip on cable (sizes #14 to 4/0). Screwdriver tightened.

IT'S THE MARK OF AN AUTHORIZED T & B DISTRIBUTOR

The complete line of T & B fittings for conductors and raceways is sold only by recognized electrical wholesalers. It's our way of assuring you the service and savings of a friendly local source. Call him for all your electrical needs. T319

THE THOMAS & BETTS CO.

INCORPORATED

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Thomas & Betts Ltd., Montreal, P.Q., Canada

MANUFACTURERS OF FINE ELECTRICAL FITTINGS SINCE 1898

greater co-operation among the various branches of engineering.

"Every effort must be made to bring all branches of engineering together into a unified, co-operating group and to set out for common objectives," he declared.

"These then are the two great challenges we face. In the coming years, we will strive to weld our branches into a more closely knit, integrated Institute and affiliate it more effectively with the larger society of engineering. Second, a broad educational program is essential to inspire and guide the newer members of our profession and to acquaint government and business with the tremendous contributions engineers are capable of bringing to positions of management and leadership," Mr. Monteith concluded.

New Orleans IAEI group sponsors Code School

A NATIONAL ELECTRICAL Code School, sponsored by the George Welman Chapter of the International Association of Electrical Inspectors, New Orleans, La., has been set to begin Tuesday, August 24, 1954, from 7:30 until 9:30 p.m. The school will meet every Tuesday and Wednesday through October 20, 1954.

The classes will be held in the eighth floor auditorium of New Orleans Public Service, Inc., 317 Baronne St.

In the event the registration exceeds the enrollment of previous Code Schools, a second class will be held, starting Monday, August 23, 1954, and will meet every Monday and Thursday through October 21, 1954. This class will be held in the auditorium of Local 130 at 528 Bienville St., New Orleans.

Basically the Code School will cover over 400 changes shown in the 1953 Code. Many new materials, wiring methods and revisions are included in these changes.

The registration fee for the entire course will be $10 per person, payable in advance. Fees and name and address of registrants are to be mailed to B. Z. Segall, 2801 Joseph St., New Orleans 15, La. Admission cards will be mailed to each registrant to be shown at the door when attending classes.

Stroud succeeds Drumm as BLBS Bureau chairman

H. A. STROUD, promotion manager of the Monongahela Power Co., Fairmont, W. Va., has been elected chairman of the Better Light Better Sight Bureau. Mr. Stroud succeeds S. L. Drumm, vice-president in charge of sales, New Orleans Public Service, Inc., New Orleans, La., who has been chairman of the Bureau since 1952.

An active participant in Bureau affairs, Mr. Stroud served on the Bureau Home Lighting Education Committee for over ten years, and was chairman of that committee during the years 1946-48 and 1951-54. He has taken a leading part in the development of several widely used Bureau programs for teaching about light and sight in school classes.

Mr. Stroud has also been prominent in activities of the Edison Electric Institute's Commercial Division. He was chairman of the division's Residential Section from 1948 to 1950, and was chairman of the Residential Lighting Committee for the previous four years.

Mr. Stroud, a graduate of Penn State University, has been employed with Monongahela Power and associated companies for 29 years.

Better Light Better Sight Bureau, 420 Lexington Ave., New York 17, N. Y., was organized in 1934 under the sponsorship of the electric industries to foster through educational means a better understanding of the relationship of light and sight. The Bureau is marking its 20th Anniversary this year.

The official division of General Electric's former Meter and Instrument Department is vividly portrayed here as C. Howard Black (right), general manager of the newly-formed Instrument Department, presents the U. S. patent certificate for G-E's 1890 watthour meter to Donald E. Craig, general manager of the new Meter Department. In left foreground is the 64-year-old meter, forerunner of the company's modern meter line.

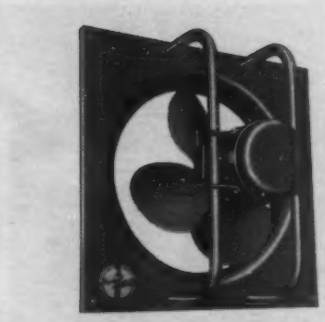
General Electric forms two new departments

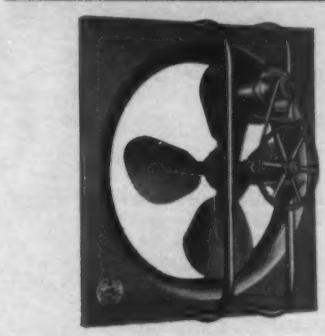
THE FORMATION of two new General Electric Company organizations, a Meter Department and an Instrument Department, was announced recently by Harold E. Strang, vice-president and general manager of G-E's Measurements and Industrial Products Division, Lynn, Mass.

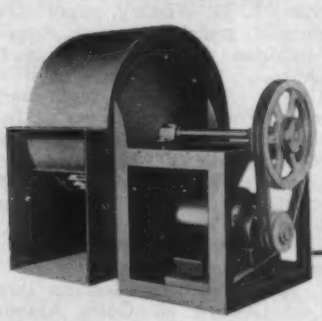
An additional step in the company's decentralization program, the move divides the former Meter and Instrument Department into two separate units. The Meter Department will make its headquarters at Somersworth, N. H., while the Instrument Department will remain in Lynn.

In announcing the change, Mr. Strang said "this is basically an organizational development, as facilities for the manufacture of meters have been in operation at Somersworth since 1948, and only a few key personnel will be transferred to that location."

C. Howard Black, formerly general manager of the Meter and Instrument Department, has been named general manager of the new Instrument Department, while D. E. Craig, previously manager of the Somersworth plant, has been appointed general manager of the new Meter Department, it was also announced.







IMMEDIATE DELIVERY

COMPETITIVE PRICES

ON-THE-JOB ENGINEERING

If competition's getting tough, you need the kind of service and products that Peerless—and **ONLY PEERLESS**—offers. You want fast deliveries—OK, you get them immediately on any fan or blower in the big Peerless line. You want prices—OK, you get them from Peerless because Peerless builds the entire unit, determines its own prices, pegs prices and holds them. You want engineering help—OK, you get it at no cost from Peerless simply by asking for it, and if necessary, Peerless flies an engineer to your office. You want to eliminate call backs—OK, you do it with Peerless because you get rugged construction, sound engineering and guaranteed motors that are built and job-matched by Peerless for the specific fans and blowers they power.

Peerless gives you everything you need: iron-clad guarantees—and product registrations that permit you to order replacement parts by number.

Check and see, compare and prove that you buy best, sell best, install best and are served best when you deal with the fan and blower manufacturer that offers you most—Peerless Electric.

FAN AND BLOWER DIVISION

THE PEERLESS ELECTRIC COMPANY

1421 WEST MARKET ST. · WARREN, OHIO

Peerless Electric

Western Insulated expands Bronco plant

WESTERN INSULATED Wire Co., manufacturer of Bronco heavy duty portable electrical cords and cables, announces a thirty per cent expansion of plant area. The Los Angeles factory will utilize this additional space for rubber mixing operations and for finished product warehouse space. Now Bronco cables are completely made—from wire drawing to packaged product—under one roof.

The additional warehousing facilities mean that a large stock of the complete line can be continuously maintained for the first time since World War II. Any size wire in the Bronco line will be available for immediate shipment to district warehouses, agents, and distributors throughout the country.

Established in 1937 by Edward H. Lewis, Western Insulated Wire Co. has pioneered and specialized in the manufacture of portable cords and cables with Neoprene jackets. Bronco 60 Certified — brand name which designates portable cords and cables with 60 per cent by weight Neoprene jackets —is made in Types SO, W, G, SJO, and Welding Cable.

This architect's drawing shows Western Insulated Wire Company's new, expanded Los Angeles plant, which affords 30 per cent more space for the manufacture and storage of the firm's Bronco portable cords and cables.

Marvin moves, triples previous plant space

IN ITS FOURTH MOVE in seven years, a move that triples it previous space, Marvin Manufacturing Co., manufacturers of the Marco line of recessed lighting fixtures and ventilating fans, has taken over a new factory at 648 Santa Fe Ave., Los Angeles, Calif.

"Our new plant, with its 75,000 square feet of floor space, parking facilities for 120 cars, spur track and overhead conveyor system, is believed to be the largest factory manufacturing recessed lighting fixtures west of Chicago," say Mr. Beber and Jerry Feig, owners of this fast growing concern. They add, "Public acceptance of recessed lighting, for both commercial and residential uses, has expanded enormously during the past few years. We've had to move to keep up with it."

Large as their new plant is, size is not its most outstanding characteristic. It features a completely modern paint department that is a model of assembly line efficiency. All degreasing, bonderizing, painting and drying is handled by an automatic overhead conveyor system. One man puts the fixture housings on the continuous line, and the parts go through the several degreasing, bonderizing, and paint processes on their own. They travel all the way to the opposite end of the large plant by conveyor to the assembly and packaging departments.

The fabrication of the fixtures is also on an assembly line basis. The latest and most modern equipment in automatic punch presses and electric welders fabricate the sheet steel into incandescent recessed lighting fixtures and ventilating fans.

These modern automatic punch presses fabricate sheet steel into Marco incandescent recessed lighting fixtures and ventilating fans at the new 75,000 square foot plant of Marvin Manufacturing Co., in Los Angeles, Calif.

Fred Bradley elected Buyers' Group chairman

FRED D. BRADLEY of Dallas, purchasing agent and assistant treasurer of Southern Union Gas Co., was elected chairman of the Public Utility Buyers' Group, National Association of Purchasing Agents, at the national convention held in Chicago recently. Other officers elected were: Robert F. Isenhart, manager of purchasing and stores division, Dayton Power & Light Co., Dayton, Ohio, first vice-chairman; L. G. Wiseley, superintendent of purchases and supplies, Michigan Consolidated Gas Co., Detroit, Mich., vice - chairman; Harold T. Belcher, purchasing agent, Consumers Power Co., Jackson, Mich., vice-chairman; and R. H. Sperreng, purchasing agent, Union Electric Company of Missouri, St. Louis, Mo., secretary-treasurer.

Southern members of the executive committee elected were: J. R. Carmichael, Georgia Power Co.; George H. Cole, Alabama

To keep in step with your constantly changing business, your communication system should be examined periodically. In that way, your communications never become outdated — always meet your exact needs at the lowest cost. If you have Bell System service, such studies are a continuing activity.

Bell System communication engineers will also help you take a good, close look at your own communications . . . *at no cost to you!* Their detailed study will help you get the most efficient use of your facilities . . . whether they are long distance, mobile, teletypewriter, or metering and supervisory control.

A growing number of power companies are taking advantage of Bell System service in meeting the communications demands of modern operation.

• • •

If you are interested in a detailed communication survey by Bell System engineers without charge, call your local Bell Telephone representative now.

PRIVATE-LINE TELEPHONE

TELETYPEWRITER

MOBILE TELEPHONE

METERING CHANNELS

BELL TELEPHONE SYSTEM

ANNOUNCING THE NEW

HUBBELL

20 amp.

AC

alternating current

Topper Switch

Now available in both 15 and 20-amp. ratings.

Meets the need for a quiet, yet dependable, long-life AC switch to withstand the inductive load characteristics of fluorescent systems.

20 Amperes
120-277 volts
Catalog No. 1221

QUIET operation

Note red top for easy identification of Topper 20-amp.

ONLY HUBBELL TOPPER SWITCHES COMBINE ALL THESE FEATURES

- Shallow size *Topper switches are shallower—take up less room*
- Quiet operation (without mercury)
- Large, fine silver contacts
- Operates in any position
- Upset binding screws
- Long life at full rated loads
- Back and side wiring utility
- Convenient strip gage
- Easy-to-find back wiring entry holes

A Switch Designed for the Purpose

. . . to control large inductive circuits at full rated capacity. This means that, amp. for amp., Topper controls more fluorescent fixtures than outmoded switches. It also means that larger areas can be controlled with one switch, and that heavier circuits can be run and fewer of them, resulting in lower material and labor costs.

Write today for free Topper folder.

TOPPER AC SWITCHES		
	15-AMP.	20-AMP.
S P single pole	1201	1221
D P double pole	1202	1222
3 W 3-way	1203	1223
4 W 4-way	1204	1224

Available in brown and ivory.

See Your Electrical Distributor.

Highest Grade HEAVY DUTY WIRING HUBBELL DEVICES

HARVEY HUBBELL, Inc.
DEPT. R-2
BRIDGEPORT, CONNECTICUT

19HH54

Power Co.; Mark B. Covell, Union Electric Co. of Missouri; J. R. Millikan, Dallas Power & Light Co.; James J. Morse, New Orleans Public Service, Inc.; Ben R. Newbery, Lone Star Gas Co.; R. V. Spangler, Duke Power Co.; and Arthur Ziegler, Consolidated Gas, Electric Light & Power Co., Baltimore.

The Public Utility Buyers' Group, consisting of representatives of over 300 utilities companies, is the largest single group within the National Association of Purchasing Agents, which has more than 16,000 members.

The 24th annual Mid-Winter Conference of the Public Utility Buyers' Group will be held at the Shamrock Hotel, Houston, Texas, February 13, 14, and 15, 1954.

Howard Foundry forms electrical subsidiary

HOWARD FOUNDRY CO., Chicago, has announced the formation of a new subsidiary, Howard Electric Co., which will manufacture a completely new type of electrical underfloor system for office and industrial buildings. Plants and general offices are at 1700 North Kostner Ave., Chicago, which also is headquarters for six foundry plants, one located in Milwaukee and one in Los Angeles.

Full production of the new underfloor system is to start in September. Manufacturer's representatives are being appointed to handle sales, which will be promoted nationally.

James W. Hudson

Recently appointed to Howard Electric were James W. Hudson, general manager, and A. J. Carroll, assistant manager in charge of engineering and production. Both men were formerly with Walker Brothers, Conshohocken, Pa., manufacturer of industrial electrical equipment.

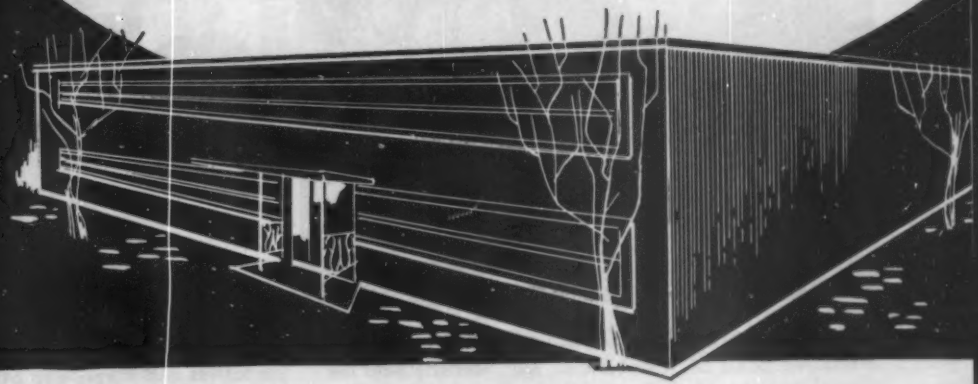
Wheeler Lighting Installation for Doelcam Corp., Boston, Mass. Lockwood Greene Engineers, Inc.

Wheeler

LIGHTING FIXTURES

A BASIC PRODUCTION TOOL OF AMERICA'S LEADING INDUSTRIES!

Where good lighting is a "must," you'll find Wheeler on the job! In industry after industry . . where modern progressive thinking rules . . Wheeler Lighting Fixtures are the logical choice for maximum lighting efficiency!



Wheeler WHEELER **REFLECTOR COMPANY**

275 CONGRESS STREET, BOSTON 10, MASS.

Lighting Equipment Specialists Since 1881

DISTRIBUTED EXCLUSIVELY THROUGH ELECTRICAL WHOLESALERS

Mr. Hudson is a graduate of Gettysburg College. He started with Walker in 1939 as a research chemist. During World War II, he served in Europe with the Office of Strategic Services, returning to Walker in 1946 to become director of research.

Mr. Carroll is a graduate of Villanova College. He joined Walker in 1942, organizing the company's time standards section. More recently, he initiated and managed the industrial engineering department.

Square named Berko Knoxville distributor

THE BERKO ELECTRIC Manufacturing Corp., 212-40 Jamaica Ave., Queens Village, N. Y., has recently appointed Square Supply Co., Knoxville, Tenn., as distributor of its electric radiant heating glass panels for the Knoxville area, according to a recent announcement by Stanley B. Aronson, Berko sales manager.

Melvin Goldberger is president of Square Supply Co.

General Cable elects assistant to president

ARTHUR Z. BARNES, Southwestern district sales manager, has been elected assistant to the president of General Cable Corp., New York, N. Y., it was announced recently by J. R. MacDonald, president.

Mr. Barnes will have his headquarters in Dallas, Texas, and will also be responsible for district sales offices in St. Louis, Kansas City, Memphis and New Orleans.

He first joined General Cable in 1929 as Dallas district sales manager. His entire career has been closely associated with electrical power, transmission and distribution for utilities, the construction industry, the railroads, the communication industry and many other prominent users of electrical wire and cable.

A. Z. Barnes

Richberger's adds Reed to sales staff

ANNOUNCEMENT has been made by S. F. Hiller of Richberger's Sales Specialists, 278 S. Front St., Memphis, Tenn., of the appointment of Everett E. Reed to their sales staff. Mr. Reed, formerly in the retail appliance business in Dyersburg, Tenn., will travel the middle and eastern parts of Tennessee, the Southern part of Kentucky, the western part of Georgia, the northwestern part of Florida, and the State of Alabama for Richberger's.

Mr. Reed replaces L. G. Crowder, who has been associated with the firm for the past 15 years. Mr. Crowder was forced to give up the territory due to illness, but hopes to be able to cover the city of Nashville in the near future.

Richberger's, manufacturers' agents since 1905, represent Deal Electric Co., Acorn Insulated Wire Co., Arts Specialty Co., H. E. Williams Products Co., Richlite Fluorescent Starters, and Wolta Electrical Co.

Top utility executives hold training course

FORTY TOP public utility executives from 16 states recently held an intensive four-week training course at the Georgia Institute of Technology, Atlanta.

Initiated and sponsored by the Southeastern Electric Exchange, the course had as its aim the improvement of the level of management knowledge and understanding of the group in order to provide better service to the public and to create more harmonious relations between the companies and their employees and stockholders.

Subjects covered during the 84 hours of classroom work included general management, economics, personal development, public utili-

OPEN HOUSE — Clingan Electrical Supply Co., 446 North Mechanic St., Cumberland, Md., recently held the formal opening of their new three story building. The building is highlighted by a display room done in knotty pine. At left, a portion of the more than 500 dealers, electricians, electrical contractors, manufacturer's representatives and others who attended the opening. At the right, Clingan personnel: Kenneth Messman, salesman; Mrs. June K. Mutchner, secretary; Jack Slack, counterman; Samuel E. Clingan, owner; and Owen Rice.

You see... most of your inventory is unnecessary because... as a distributor... our warehouse is well stocked with almost every aluminum conductor item on your list.
And in a wide range of sizes and constructions, Bob!

What's more, we can guarantee fast, dependable delivery as your schedule calls for it!
In other words, you virtually become our warehouse.

That's right! And you eliminate most of the high cost of maintaining a large inventory.
Makes sense to me!
Then we'll try it... beginning now!

Why not let your Kaiser Aluminum Distributor help solve your inventory problem? A phone call will bring friendly, personal attention on any size order.

Kaiser Aluminum Distributors Conveniently Located to Serve You:

Line Material Co.
General Electric Supply Co.
Westinghouse Electric Supply Co.
Capital Electric Supply
Central Electric Supply Co., Inc.
Champion, Inc.
City Electric Distributors, Inc.
Corpus Christi Hardware Co., Inc.
Crescent Electric Supply Co.
Dauphin Electrical Supplies
Dutton-Lainson Co.
Electrical & Mechanical Supply Corp.
Eoff Electric Co.
Evans Electrical Supply, Inc.
Florida Electric Supply, Inc.
George H. Wahn Co.
Hampden Electric Supply Co.
Hunzicker Brothers
Interstate Electric Co. of Shreveport, Inc.
Mack Electric Supply Co.
Maydwell & Hartzell, Inc.
Nelson Electric Supply Co.
Ozark Electric Supply Co.
Russell Belden Electric Co.
S. M. Supply Co., Inc.
Southern Minnesota Supply Co.
Stuart C. Irby Co.
Stubbs Electric Co.
The Korsmeyer Co.
Virginian Electric, Inc.
Waltrip Electric Co.

GET IN TOUCH with your nearest Kaiser Aluminum Distributor *now*. He makes available long experience, specialized knowledge, and valuable engineering services—including the famed field and engineering services of Kaiser Aluminum. For his name, refer to the list at the left and your local telephone directory. Kaiser Aluminum & Chemical Sales, Inc. *General Sales Office*, Palmolive Bldg., Chicago 11, Ill.; *Executive Office*, Kaiser Bldg., Oakland 12, California.

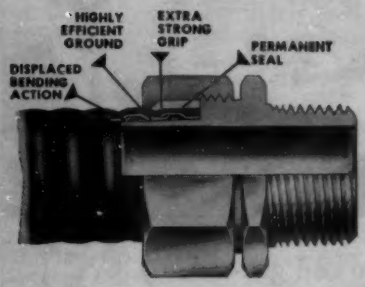
Kaiser Aluminum

The Nation's Largest Supplier of Aluminum Weatherproof Conductor and Triplex

it's new...

an improved connector for liquid-tight flexible conduit

(Sealtite or equivalent products)



PYLE-NATIONAL

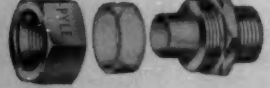
"CT" series Connectors offer all these advantages

EXTRA STRONG GRIP
- Compression force applied against body shank—not against the conduit alone, making a vise-like clamp.
- Gripping is well behind end of flexible conduit for firm anchorage.
- Pliable seamless sleeve makes a plastic-to-plastic grip with the conduit sheath ... thereby avoids cutting and abrasion common to metal sleeves.

PERMANENT SEAL
- Plastic Sleeve and Conduit Sheath have equivalent physical characteristics therefore the seal will last the life of the conduit.

HIGHLY EFFICIENT GROUND
- Less than 10 millivolt drop.
- Tapered body shank, makes a firmly wedged contact with the flexible metal conduit.

DISPLACED BENDING ACTION
- Tapered body shank is elongated to extend beyond gland nut, thus avoiding short radius bends which shorten the life of the conduit sheath and the permanency of the joint.



"CT" series connectors can be installed assembled. Available in Straight, 45° and 90° types for ¾" to 2" conduit. Meet U/L and J.I.C. standards.

SINCE 1897

THE PYLE-NATIONAL CO.
1354 North Kostner Avenue
Chicago 51, Illinois

ty regulation, finance, accounting, marketing, public relations, personnel administration, and industrial relations. In addition there were discussion periods, problem laboratories, and reading and research assignments.

The advisory committee for the course included W. E. Wood, executive vice-president, Virginia Electric & Power Co.; J. M. Barry, chairman of the executive committee, The Southern Co.; C. L. Emerson, vice-president, Georgia Tech; Lee C. McClurkin, president, Savannah Electric & Power Co.; McGregor Smith, chairman of the board, Florida Power & Light Co.; and J. W. Talley, managing director, Southeastern Electric Exchange.

Speakers from business and the public utility industry were headed by Mr. Wood, a member of the Advisory Committee. Others were Robert Lyman, resident-partner, Arthur Anderson Co.; C. B. McManus, president, The Southern Co.; Charles A. Collier, vice-president, Georgia Power Co.; Paul A. Canaday, vice-president, Middle South Utilities, Inc.; James E. Yuill, associate sales manager, Prudential Insurance Co.; Howard P. Mold, director of training, Minneapolis-Honeywall Regulator Co.; and Lewis F. Gordon, Atlanta business consultant.

Sorgel appoints Miller Carolina representative

ANNOUNCEMENT of the appointment of Max I. Miller, Greensboro, N. C., as representative for North and South Carolina has been made by William Sorgel, Sorgel Electric Co., 838 W. National Ave., Milwaukee, Wis.

Mr. Miller will handle the entire line of Sorgel dry-type and liquid filled transformers and unit substations in this territory.

Moe Light appoints regional managers

R. W. MINETT, JR., general sales manager, has announced the appointment of three regional managers for newly-formed sales regions of the Moe Light Division of Thomas Industries, Inc., Fort Atkinson, Wis.

S. B. Levaur will head the Eastern Region; Roy W. Vershure will manage the East Central Region; and Vernon L. Wrye will supervise the South Atlantic States Region. The new regional managers are all members of long standing of the Moe Light sales staff, and all three men held positions as district managers until taking over the regional managerships.

This reorganization of sales territories anticipates the addition of several new Moe Light sales representatives, and is in accordance with the expansion of Moe Light's sales activities as a result of their recently - launched Inspiration Lighting program.

Name Texas representative for Pittsburgh Reflector

PITTSBURGH REFLECTOR CO., Pittsburgh, Pa., has appointed the firm of Wayne D. Close Co., as its representative for fluorescent and incandescent lighting equipment in the Southern Texas territory. The firm, headed by Wayne D. Close, has its headquarters at 5904 Monsanta Dr., Houston.

Mr. Close is a graduate engineer from Stanford University and is well-known in the territory he serves. He has a broad knowledge of the field of commercial, institutional and industrial lighting. He is a member of many business and professional organizations including membership in the Illuminating Engineering Society.

Al Levin & Associates appointed Peco agents

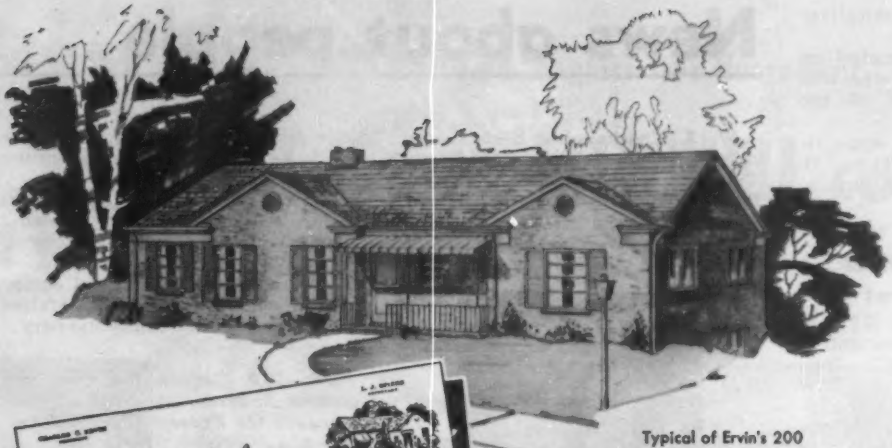
AL LEVIN & ASSOCIATES, 410 Notre Dame St., New Orleans, La., have been appointed representatives for Producto Electric Co., New York, N. Y., in the states of Louisiana and Mississippi and in Mobile, Ala., Memphis, Tenn., and Pensacola, Fla. They will handle the complete PECO line of electrical conduit fittings in this territory.

Blackhawk appoints Georgia representative

BLACKHAWK INDUSTRIES, 250 S. Main St., Dubuque, Iowa, manufacturers of electrical fittings and fixtures, has announced the appointment of Griffin and Griffin, 931 W. Peachtree St., N. E., At-

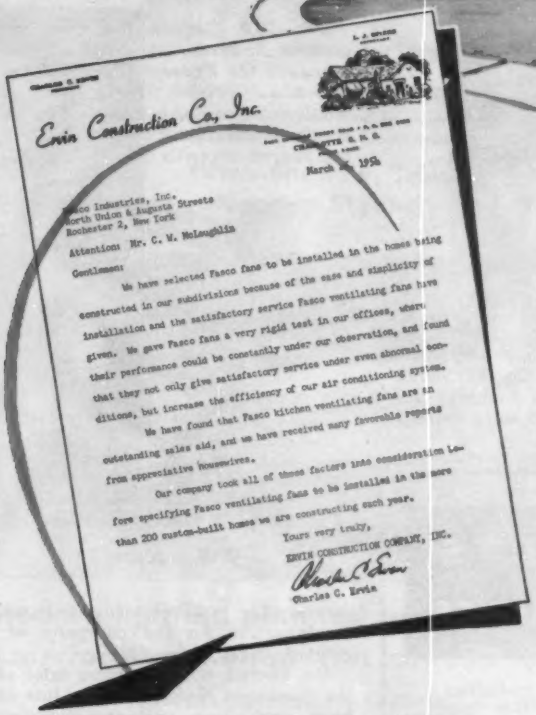
Correction

In the article entitled "New techniques in stadium lighting," July issue, ELECTRICAL SOUTH, a typographical error occurred in the third column, second page. "Each of the 24 luminaires contains a 1500 PS-52 lamp, burning at 10 per cent above rated voltage" is the way the second sentence in this column should read.



Typical of Ervin's 200
Custom-Built Homes

Charles C. Ervin, President
Ervin Construction Co., Inc.
Charlotte, North Carolina



Ervin Construction Co., Inc.

March [illegible] 195[illegible]

Fasco Industries, Inc.
North Union & Augusta Streets
Rochester 2, New York

Attention: Mr. C. W. McLaughlin

Gentlemen:

We have selected Fasco fans to be installed in the homes being constructed in our subdivisions because of the ease and simplicity of installation and the satisfactory service Fasco ventilating fans have given. We gave Fasco fans a very rigid test in our offices, where their performance could be constantly under our observation, and found that they not only give satisfactory service under even abnormal conditions, but increase the efficiency of our air conditioning system.

We have found that Fasco kitchen ventilating fans are an outstanding sales aid, and we have received many favorable reports from appreciative housewives.

Our company took all of these factors into consideration before specifying Fasco ventilating fans to be installed in the more than 200 custom-built homes we are constructing each year.

Yours very truly,

ERVIN CONSTRUCTION COMPANY, INC.

Charles C. Ervin

HERE'S WHY THIS SOUTHERN BUILDER SPECIFIES . . .

FASCO
VENTILATING FANS

- **Ease and Simplicity of Installation**
- **Satisfactory Service Under Even Abnormal Conditions**
- **Increases the Efficiency of Air Conditioning**
- **Outstanding Sales Aid**
- **Receives many favorable reports from appreciative housewives**

MODEL 728
CEIL-N-WALL
VENTILATING FAN

This Fasco Ventilating Fan is adaptable for a wide range of installations—inside wall above stove—thru cabinets—in ceiling. Housing 3¼" thick. Engineered for most difficult type of exhausting—by pressure thru ducts. 7" Turbo-Radial Impeller develops pressures unobtainable by ordinary fan blades. 325 C.F.M.

FASCO
INDUSTRIES, INC.

SPECIFY FASCO FOR EVERY VENTILATING FAN INSTALLATION

38 Augusta Street • Rochester 2, New York

MANUFACTURERS OF THE ONE COMPLETE LINE OF VENTILATING FANS

lanta, Ga., as sales representatives in their area.

The Atlanta firm is headed by Robert and John Griffin, who will carry a complete stock of the Blackhawk line.

Announcement of the appointment was made by Titus B. Schmid, president of Blackhawk.

Fan manufacturers elect R. W. Nelson president

R. W. NELSON, vice-president of the American Air Filter Co., Inc., was elected president of the National Association of Fan Manufacturers, Inc., at the group's recent annual meeting held at the Greenbrier, White Sulphur Springs, W. Va.

Other officers named were: C. C. Cheyney, vice-president of Buffalo Forge Co., vice-president; J. M. Birkenstock, general manager of the Green Fuel Economizer Co., Inc., and out-going president of the group, honorary vice-president; and G. W. McCormick, Jr., was re-elected secretary-treasurer.

The National Association of Fan Manufacturers, Inc., maintains offices at 2159 Guardian Bldg., Detroit 26, Mich.

News about people

W. J. Thacker has been named manager of the newly-created **Power Capacitor and Control Section of Sangamo Electric Co.**, Springfield, Ill.

Mr. Thacker, a graduate electrical engineer of Worcester Polytechnic

W. J. Thacker

Institute, was previously associated with General Electric Co., Pittsfield, Mass. His background includes development, design, and sales experience in power capacitors. Most recently he has been a specialist in the distribution cutout field.

Already established in the manufacture of instruments for knowing circuit conditions by measurement, Sangamo will, by the addition of power capacitors and control equipment, extend its range of services and products to the utility industry.

Daniel P. Lacock has been appointed Southeastern regional sales manager for **Federal Electric Products Co.**, Newark, N. J., and its wholly-owned subsidiary, Pacific Electric Manufacturing Corp., it was announced recently by T. M. Cole,

D. P. Lacock

president. Southeastern regional headquarters for the company are located in Atlanta, Ga.

Mr. Lacock will supervise sales of the combined Federal-Pacific line of high and low voltage electrical switchgear, controls, and distribution equipment in North Carolina, South Carolina, Georgia, Florida, Alabama, and parts of Tennessee, Louisiana, and Mississippi.

Until his present appointment, Mr. Lacock had served as assistant sales manager of Kuhlman Electric Co., since 1951. He was also employed by Westinghouse in the public utility sales department.

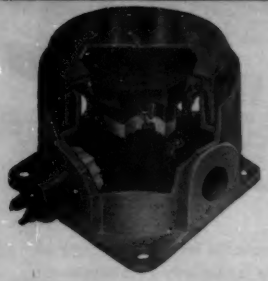
During World War II, Mr. Lacock served in the U. S. Navy. He is a graduate of Massachusetts Institute of Technology.

J. Wylly Keck, Jr., son of Florida Power & Light Company's superintendent of generating stations and Mrs. Wylly Keck, Coral Gables, Fla., has opened an office in Atlanta, Ga., for the practice of consulting engineering.

Mr. Keck will specialize in complete engineering services to the manufacturing and process industries. He attended Georgia Tech and

Latrobe PRODUCTS

FLOOR BOXES • WIRING SPECIALTIES



"Latrobe" Floor Boxes and Wiring Specialties are designed for quick, easy installation and superior performance. Stripped of frills and complex assembly, "Latrobe" Products do their job smoothly and economically.

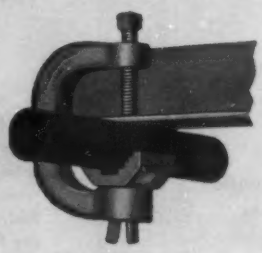
Adjustable Watertight Floor Boxes

All adjustable boxes are now equipped with a positive bond which makes them completely fire-proof.

Pipe or Conduit Hanger

The most economical and best pipe hanger sold today—rust-proof.

For hanging pipe ½" to 1½" thick to steel beams ⅜" thick.



Represented in the South by

FULWILER & CHAPMAN, INC.
702 Whitehall St., S.W., Atlanta, Ga.
213 S. Front St., New Orleans 12, La.
445 English St., Greensboro, N. C.

FRANK P. WALTER CO.
4030 Chouteau Ave., St. Louis 10, Mo.

FRED H. SIMMER CO.
1406 S. Akard St., Dallas 1, Texas

FULLMAN MANUFACTURING CO.
LATROBE . . . PENNSYLVANIA

Best for Schools glare-free fluorescent...nearest to daylight

MITCHELL *LODESTAR*

featuring

TRANSLUCENT SIDES

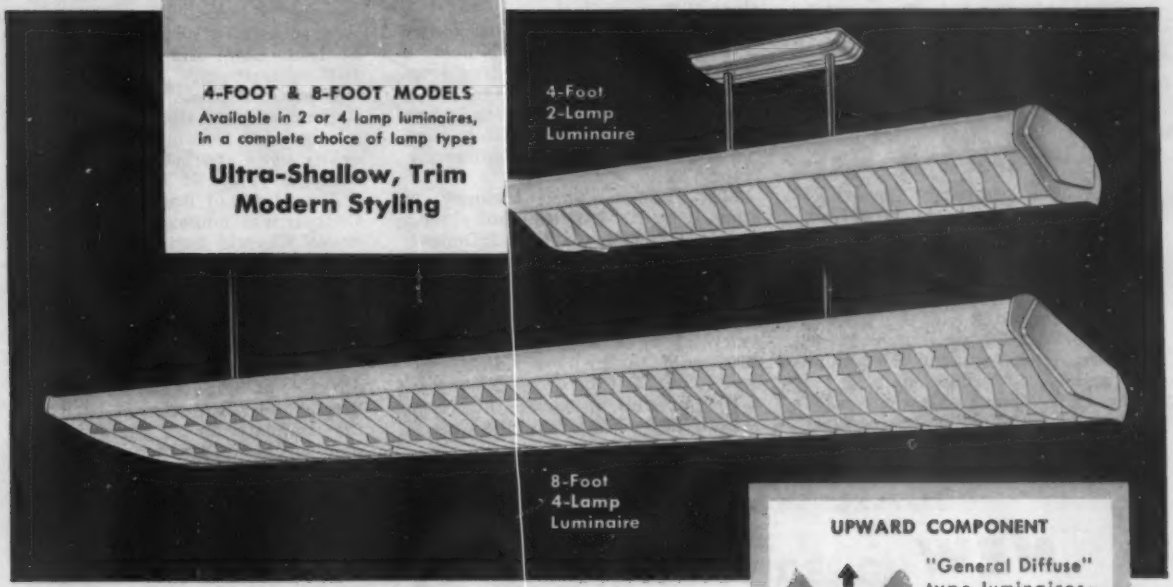
and

35°/25° SHIELDING*

4-FOOT & 8-FOOT MODELS

Available in 2 or 4 lamp luminaires, in a complete choice of lamp types

Ultra-Shallow, Trim Modern Styling



UPWARD COMPONENT

"General Diffuse" type luminaires; approximately half the light goes up to be reflected from ceiling or upper walls for comfortable, glare-free, uniform lighting.

SEMI-TRANSLUCENT SIDES

Provides low brightness contrast, creating modern streamlined appearance. Plastic sides and louver are one easy-to-handle unit.

modern lighting planned for today's schools— superior illumination with low cost maintenance

MITCHELL engineering perfects a new standard for school lighting. The "LODESTAR" Luminaire offers abundant light distribution with an absence of glare to approximate daylight conditions. This important lighting advance is attained by the substantial upward component with its "general diffuse" lighting effect, the semi-translucent side panels with pleasing low brightness contrast, and the superior louver design (35°/25°* cutoff) which delivers properly shielded illumination to working areas. Smooth styling, very low maintenance factor and surprisingly low cost make the MITCHELL "LODESTAR" Luminaires the wisest choice for School Lighting.

*Also available with 35°/45° shielding.

where quality counts *SPECIFY*

MITCHELL

MITCHELL MANUFACTURING COMPANY

2525 N. Clybourn Ave., Chicago 14, Illinois

In Canada: Mitchell Mfg. Co., Ltd., 19 Waterman, Toronto

Mitchell Manufacturing Company, Dept. 8-H
2525 N. Clybourn Ave., Chicago 14, Illinois

Send full data on MITCHELL "Lodestar" Luminaires.

Name.....

Firm.....

Address.....

City.....Zone...State.....

H. D. Tindall

E. F. Classen

D. E. Spackler

F. J. Connell

Carl Hellweg

H. S. Thomas

has been registered to practice professional engineering in Georgia, Florida, South Carolina and New York. Until recently he was associated with Foster Wheeler Corp., New York City, as a service engineer and in a number of design engineering capacities.

A number of recent personnel changes and appointments have been announced by the **Moloney Electric Co.**, St. Louis transformer manufacturer.

Howard D. Tindall, formerly section engineer of the Distribution and Specialty Transformer Divisions, has been appointed assistant chief engineer and vice-president.

Mr. Tindall is an electrical engineering graduate of Ohio State University and has been with Moloney since 1940.

Another vice-presidential appointee is **Edward F. Classen**, who holds a B.S. in Electrical Engineering from Southern Methodist University, an M.S. in Electrical Engineering and an L.L.B. from Washington University, St. Louis, and St. Louis University, respectively.

Mr. Classen joined Maloney in June 1950. He was previously with Emerson Electric Co., and McDonnell Aircraft Corp., St. Louis.

Donald E. Spackler, also recently appointed a vice-president, holds a B.S. in Engineering from the Missouri School of Mines and did graduate work in Business Administration at St. Louis University.

Mr. Spackler, an Air Force veteran of both World War II and the Korean War, joined Moloney in 1950 as a member of the sales department and was subsequently employed in the St. Louis plant and the Chicago district sales office.

Fred J. Connell, who joined the Moloney organization as director of purchases in December 1945, has recently been appointed district sales manager of the St. Louis office.

A graduate of Boston College, Mr. Connell was employed by Westinghouse Electric Supply for over 12 years. During World War II, he was in charge of buying electrical equipment for the Advance Base Division of the U. S. Navy Bureau of Yards and Docks (Seabees).

Carl Hellweg has been appointed director of purchases for Moloney Electric. Mr. Hellweg has been with the company for 26 years and has seen service in practically every department of manufacture. Most recently he served for 3½ years in the department of material control.

Moloney Electric has also announced the opening of a district sales office in Chattanooga, Tenn., and the appointment of **Harry S. Thomas** as district sales manager.

Mr. Thomas was formerly district manager of the Jersey Central Power & Light Co., Morristown, Pa. Until his recent appointment, he served as an agent for Moloney with the Engineer Sales Corp., St. Petersburg, Fla.

Columbia Cable & Electric Corp., Brooklyn, N. Y., announces the appointment of **E. F. Lombardi**, 914 E 4th St., Charlotte 6, N. C., as agent for North Carolina and South Carolina. Mr. Lombardi will carry the complete Columbia line.

Three key members in the sales organization of the **Westinghouse Lamp Division** have been advanced. **Charles E. Erb** has been named general sales manager, **Russell E. Ebersole** marketing manager, and **Herbert E. Plishker** merchandise manager.

Robert H. Morse, Jr., president, **Fairbanks, Morse & Co.**, has announced the appointment of **R. H. Morse III** to assistant to the vice-president in charge of sales, with headquarters in Chicago.

Mr. Morse III has been located in

NEW LOW COST SERVICE ENTRANCE HEAD

No. 253 Entrance Head fits cable sizes 10/3 to 6/3 S.E.C.

THIS is the slickest fitting yet devised for economy use in entrance cable wiring. *It's quick* — slotted top cover lifts off by merely loosening one screw. *It's rugged* — made of non-rusting cast aluminum with bakelite insulators. *Finished, too* — with two screw clamps to secure cable in neat, dependable installation. Here is quality priced to today's market. *Write for full details.*

Non-Watertight Connectors — Ground Clamps — Service Entrance Kits — Service Entrance Caps, Straps and Sill Plates — BX and Romex Connectors.

M&W Electrical Fittings
The M. & W. ELECTRIC MFG. CO., Inc.
EAST PALESTINE, OHIO

TROFFERS

Years ahead in design....

PARGLO* LOUVERS

ANOTHER *Eastern* EXCLUSIVE

TO GIVE RECESSED LIGHTING

- UNBELIEVABLE NEW BEAUTY
- DISTINCTIVE DESIGN
- TRUE LIGHTING EFFICIENCY

SEND FOR COMPLETE CATALOG

EASTERN FIXTURE CO.

170 VERNON STREET, BOSTON 20, MASSACHUSETTS

Beloit, Wis., the past eight years, after completing a period of service with the United States Navy, and has been general manager of the Beloit plant for the last two years.

Paul Griffith, industrial sales manager for **Arkansas Power & Light Co.**, has been named manager of the company's Little Rock Division, President **R. E. Ritchie** has announced. Mr. Griffith replaces **R. Bly Wagner**, who is retiring after more than 30 years service.

Paul Griffith

Succeeding Mr. Griffith as industrial sales manager is **Howard P. Lindsey**, industrial sales engineer of Pine Bluff, a 20-year veteran with AP&L.

Mr. Wagner's service with AP&L dates back to November 1, 1923. He first served as assistant manager of the Pine Bluff Co., a predecessor of AP&L. He became manager of the company's Central Division at Pine Bluff in 1928, a position he held until 1946, when he was named manager of the Little Rock Division.

H. P. Lindsey

Mr. Griffith's service with AP&L dates back to 1921, when he was employed in the meter department of the old Little Rock Railway and Electric Co. He soon was transferred into the commercial department as a power sales representative, and became industrial sales manager in 1942.

Mr. Lindsey has been associated with AP&L since 1934, when he joined the general office engineering staff at Pine Bluff. In more than 20 years with the company, he has served as a rural specialist, assistant engineer, industrial salesman and industrial sales engineer.

A veteran of World War II, Mr. Lindsey served with the U. S. Air Force in the European Theater. He holds an electrical engineering degree from the University of Arkansas.

Charles G. Pyle, managing director of the **National Association of Electrical Distributors** died July 16, 1954, in Lawrence Hospital, Bronxville, N. Y., after an illness of several months.

His death brought to an end an electrical industry career of thirty-six years duration. Mr. Pyle was employed for 24 years by the Sylvania Electric Co., attaining the position of general sales manager before he resigned to join the National Electrical Wholesalers Association in December 1942 as its managing director. During his tenure the organization was renamed the National Association of Electrical Distributors. Under his direction N.A.E.D. has become one of the largest associations in the field of hard goods distribution.

E. H. Turgeon has been appointed electrical inspector for the City of Palm Beach, Fla., according to an announcement by **Hugh G. Bruce**, the city's town clerk-treasurer. Mr. Turgeon replaces **R. D. Taylor** who recently retired.

Appointment of **Arthur C. Barr**, illuminating engineer at **General Electric's** Nela Park, Cleveland, as manager of quantity consumer sales for the company's Lamp Division, has been announced by **P. D. Parker**, general sales manager.

Mr. Barr in his new position succeeds **Robert E. Worstell**, who resigned his quantity consumer sales post to accept new responsibilities in the division's sales operation department.

Mr. Barr joined G-E in 1941 to serve as cold cathode fluorescent lamp engineering specialist for the Glass Technology branch of the Lamp Division in Cleveland. He transferred to Nela Park headquarters in 1945 in the application engineering department. He was made head of the department's Lighting for Selling activity in 1951. Last year, he was named co-ordinator of

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FARADAY
No Confusion here . . .
There's order in this plant—and in the many, many other factories and offices equipped with Faraday signals and systems. They stop confusion and save steps, paging and signaling clearly and faithfully, day-after-day, year-after-year.
For generations, Faraday engineers have designed bells, buzzers, horns, chimes and complete systems to meet an endless variety of signaling needs and sound level requirements.
Consult your electrical wholesaler for details on the complete Faraday line.
HOLTZER-CABOT FARADAY STANLEY & PATTERSON
CONSOLIDATED BY:
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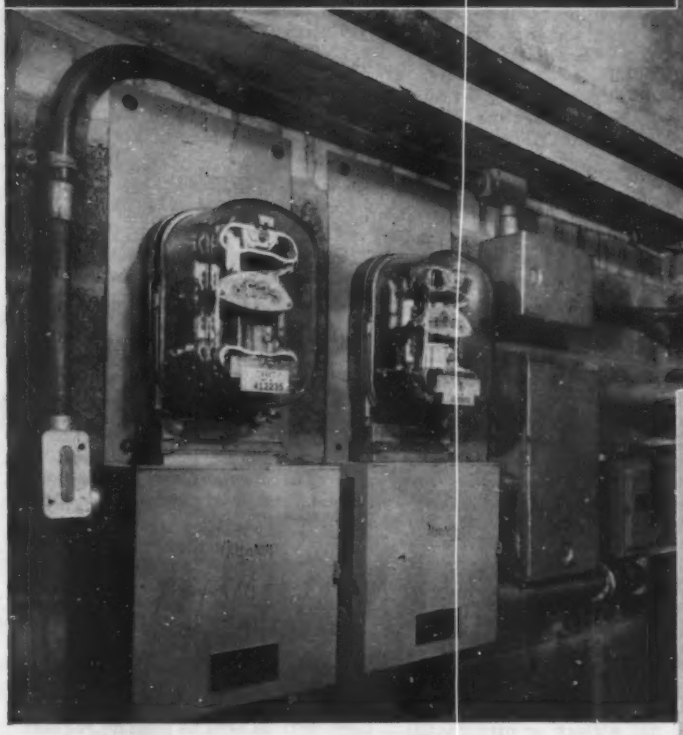
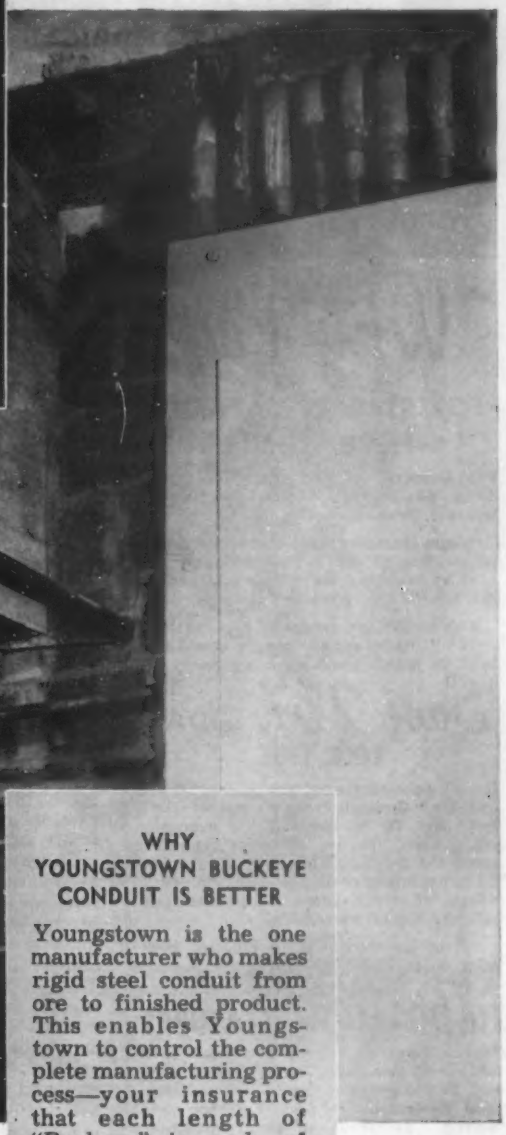
BELLS · BUZZERS · HORNS · CHIMES · VISUAL AND AUDIBLE PAGING DEVICES AND SYSTEMS

Upper Manhattan Medical Group Building, New York. Nememy, Geller & Yurchenco, Associated Architects.





WHY YOUNGSTOWN BUCKEYE CONDUIT IS BETTER

Youngstown is the one manufacturer who makes rigid steel conduit from ore to finished product. This enables Youngstown to control the complete manufacturing process—your insurance that each length of "Buckeye" is made of top-grade steel.

●The new Health Insurance Plan Clinic in the Upper Manhattan Medical Group Building, New York City, is another modern structure in which the electrical wiring is given sure protection of Youngstown Buckeye Conduit. Standard-threaded rigid steel conduit, of which Youngstown Buckeye is the leading brand, is the only wiring system approved by the National Electrical Code as moisture, vapor, dust and explosion proof in hazardous locations.

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THE YOUNGSTOWN SHEET AND TUBE COMPANY *Manufacturers of Carbon, Alloy and Yoloy Steel*

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SHEETS - STRIP - PLATES - STANDARD PIPE - LINE PIPE - OIL COUNTRY TUBULAR GOODS - CONDUIT AND EMT - MECHANICAL TUBING - COLD FINISHED BARS - HOT ROLLED BARS - BAR SHAPES - WIRE - HOT ROLLED RODS - COKE TIN PLATE - ELECTROLYTIC TIN PLATE - RAILROAD TRACK SPIKES

Why Pay

FOR STARTER CAPACITY NEVER USED?

THE ANSWER TO THIS QUESTION COULD SAVE hard-earned dollars needlessly thrown away.

When choosing from the widest range of starters in the 1-50 hp range, you save by selecting the starter matched to the job—with no wasted capacity.

Furnas Electric starters—nine of them in the 1-50 hp range—are designed and built to match most applications.

Save 25% TODAY LIKE THIS

Here's an example of typical savings you can earn through proper starter selection: for 10 hp service, for example, you'd select Furnas Electric Type YE rated for the job. This saves you up to 25% on initial costs and 40% on space over a YF size 2 (rated 25 hp) normally selected for 10 hp service.

All of the nine Furnas Electric sizes offer worthwhile savings.

Important FEATURES

Furnas Electric starters give you these additional benefits. *Dual Voltage Coils*—matched to motor voltage. *Thermal Overload Protection. Shallow Case* for easy wiring. *Durability* to stand up under rough service. *Arc Resistant Terminal Board. Arc Quenching Silver Contacts.*

Complete RANGE OF OTHER PRODUCTS

Pressure switches for air and water applications. Drum controllers for reversing, multi-speed and reversing multi-speed service.

Write today for *full story* or contact our representative near you. Furnas Electric Co., 1064 McKee St., Batavia., Illinois.

FURNAS
ELECTRIC
Batavia, Illinois

the department's fluorescent lamp product planning.

Named to fill the position vacated by Mr. Barr in the application engineering department is **Charles L. Amick**, who has been co-ordinator of sales aids for that department.

W. C. John has been appointed manager of the Roanoke branch of the **Graybar Electric Company**, Richmond District Manager **L. G. Fields** has announced. He succeeds **W. E. James** who was made manager, power apparatus sales at Richmond.

Mr. John joined Graybar as a power apparatus specialist at Richmond in January, 1928, becoming manager, utilities department in April, 1943. From January, 1944 until his present appointment he was manager, power apparatus sales. Prior to joining Graybar he had several years experience with the General Electric Co.

A native of Roland, N. C., he is a graduate of North Carolina State College with a B.S.-M.E. degree. Mr. John has served as secretary, vice-president and president of Richmond's Electrical League.

R. Marion Pickard, P. O. Box 2523, Charlotte, N. C., has been named representative for **Ilsco Copper Tube & Products, Inc.**, Cincinnati, Ohio, in the states of North and South Carolina.

Richard J. McGinn has been named manager of **Stud Welding Co., Inc.**, with headquarters at 5915 Clinton Dr., Houston, Texas. The company handles distribution of Nelson stud welding equipment and products in Texas, Oklahoma, Arkansas and western Louisiana and maintains factory branch warehouses in Houston and Dallas.

Mr. McGinn, who transferred to Houston in January after three years as a field manager for Nelson in the Philadelphia territory, is a member of the American Welding Society. He served three years with the U. S. Marine Corps during World War II.

Free bulletins

available to our readers

Steber Manufacturing Co., Broadview, Ill., has just released a new catalog bulletin covering its line of **small and medium floodlights.**

Three entirely new aluminum units are included. In these floodlights the reflector and neck are skillfully spun in one piece. Two of the aluminum units are open type with 9½ inch and 11 inch reflectors respectively. The 11 inch floodlight is also furnished in enclosed type with aluminum lens ring and thermal shock and impact resistant lens. All types are factory wired including approved cord and plug and are equipped with heavy duty mounting base for attaching to any flat surface or directly to outlet box. Copies of this new catalog bulletin, No. 128-54, can be obtained by writing direct to the manufacturer.

A new publication, **"Five steps to Productive Maintenance,"** has been announced as available from the **General Electric Co.**, Schenectady 5, N. Y.

The 18-page bulletin, designated GEA-6087, provides detailed information on organizing to meet the demands that automation will make on your electrical maintenance program. Steps discussed include, (1) Gathering equipment data, (2) Determining extent of routine maintenance, (3) Establishing a routine operating control system, (4) Evaluation for critical maintenance, and (5) Establishing a critical maintenance program.

Parr Manufacturing Corp., 44 Austin St., Newark 5, N. J., has issued a new booklet describing the **Brunt Faultfinder.**

This is an instrument used in electrical maintenance, chiefly in industrial plants, for the location of grounds in normally ungrounded electrical circuits.

It is well illustrated and contains complete information regarding the purpose and operation of the several models of the Brunt Faultfinder. A copy will be sent to anyone requesting it from the company.

The American Blower Corp., Detroit 32, Mich., has announced their new, free Bulletin 7517, which covers the latest design of their **Venturafin unit heaters for steam or hot water applications.**

The bulletin covers features of design, general engineering data, capacity tables and piping diagrams, and other pertinent data.

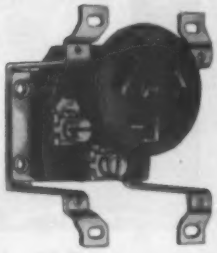
A new two-color bulletin describing Repetitive Manufacture (built in accordance with ASA Standard C57.-12a) **power transformers** has been announced as available by the **General Electric Co.**, Schenectady 5, N. Y.

The 40-page booklet, designated

P&S

30-AMPERE, 3-WIRE DEVICES for Safe, Dependable Dryer and Heater Connections

P&S 3836



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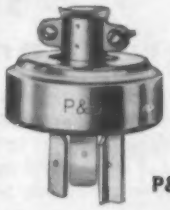
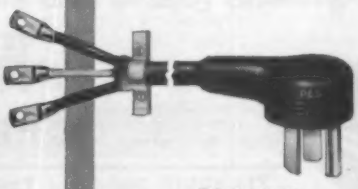


P&S 9337

P&S 9331



P&S 9339

A Complete Line . . . Receptacles, Caps, Cord Sets

with

L-Shaped Grounding Slots and Blades Designed for Quick, Easy Wiring

"Lay-in" type pressure terminals on both flush and surface receptacles. No loose pieces to be handled or misplaced.

P&S 3836, surface receptacle, has ¾" and 1" knockouts for conduit in bottom and back, and is available in brown or white (3836-W). P&S 3835 is designed for mounting on standard 4" box, with P&S 3848 Ivory-X or P&S 3849 Chrome-X plates.

Cord grip caps are heavily armored and finished to resist corrosion. Sturdy P&S 9339 cord set is non-separable, molded rubber type with three No. 10 wires.

Cash in on the increasing demand for dryer and heater connections with these new P&S devices. Place your order on your P&S distributor today.

For complete catalog, write Dept. ES

Adequate Wiring — The Key to Electrical Living — Serves and Saves

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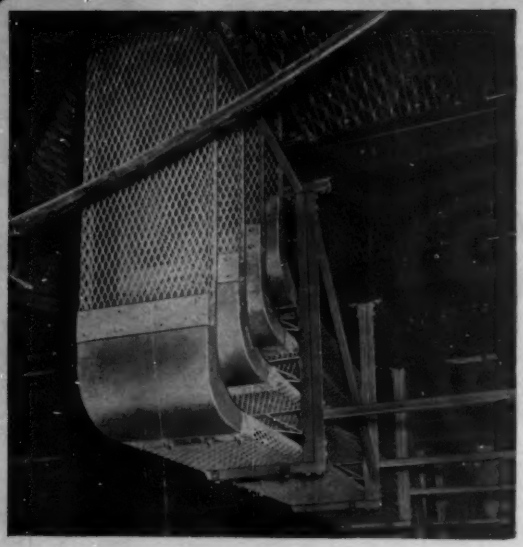
CABLE TROUGH



Etiwanda Steam Station Southern Calif. Edison Co.

for efficient and continuous support of power and control cables

Cope Cable Trough is a completely designed, standard system of flattened expanded metal trough especially designed to give continuous support to power and control circuits. The system is light but strong and can be quickly and easily erected at the job site from completely prefabricated units.

A wide range of fittings such as tees, elbows, dropouts, etc. is available which allows changes of direction and elevation to be easily made.

Installation is extremely simple—the only tools needed are a few wrenches—and once in, the trough, being hot dip galvanized after fabrication, requires practically no maintenance but is accessible should cables ever need to be inspected or replaced.

Write today for further details. Ask for Bulletin 86.

You know Cope by these products

T. J. COPE, INC.

711 SOUTH 50th ST. • PHILADELPHIA 43, PA.

Southern Representatives

Amarillo, Tex.—*Western Light and Supply Company, 75 N. Hughes St.*
Atlanta, Ga.—*The Gearhart Co., P.O. Box 85, North Side Station*
Charlotte 1, N. C.—*Glen & Larson, 123 Brevard Court*
Dallas, Tex.—*I. E. Cope & Co., 1411 Fidelity Union Life Bldg.*
Houston 2, Tex.—*I. E. Cope & Co., 2009 Fannin St.*
Jackson, Miss.—*Gregory-Salisbury & Co., 514 Court St.*
Jacksonville, Fla.—*The Gearhart Co., P.O. Box 5761*
Little Rock, Ark.—*Gregory-Salisbury & Co., 400 Shall St.*
Memphis 12, Tenn.—*Gregory-Salisbury & Co., 2523 Broad Ave.*
New Orleans, La.—*Gregory-Salisbury & Co., 820 Julia St.*
Birmingham, Ala.—*The Gearhart Co., 1727 6th Ave.*

GEA-6108, cites the application and features of standardized single phase and three phase units, ranging from 501 to 10,000 kva. Complete price data and descriptions of optional features are also included.

Axial flow, direct-connected **exhaust fans** are fully illustrated with performance charts, specification sheets, and application data in the new Bulletin 500 announced by the **M & E Manufacturing Co.**, 2537 Winthrop Ave., Indianapolis, Ind. Roof exhausters and Penthouses complete this new full line of exhaust fans; designed to provide positive exhausting of fumes as well as cooling for personnel by means of having air move over people.

A new 48 page catalog of **electrical indicating instruments**, laboratory portables and panel meters of finer accuracy is announced by the **Hickok Electrical Instrument Co.**, 10555 Dupont Ave., Cleveland 8, Ohio. This catalog, which is available upon request, provides illustrations and specifications of the more popular sizes of round, square, flush, semi-flush, switchboard, horizontal edgewise and fan type meters as well as 250 degree arc-angle sealed and ruggedized types presently available.

Announcement of the publication of a new free booklet **"Electrical Controls for the Textile Industry,"** has been made by Arrow-Hart & Hegeman Electric Co., 103 Hawthorn St., Hartford 6, Conn. The new folder contains detailed information on electrical controls that have been engineered and specifically constructed for textile applications and are not adaptations of present equipment.

A new 40 page Bulletin (No. 45) cataloging their "60" ampere **steel-enclosed trolley busway electrification system** has been announced by the **Feedrail Corp.**, 125 Barclay St., New York 7, N. Y. Included are the new 20 ampere trolleys, an enlarged line of standarized curved track sections and other items. Sectionalizing of the bulletin makes easy the selection of equipment by those who plan and specify electrical distribution systems. There are special sections on installation planning and procedure, methods of mounting, and typical applications in addition to the sections devoted to the equipment itself.

The **National Industrial Service Association, Inc.**, 818 Olive St., St. Louis 1, Mo., the association of electric motor repair shops for co-operative self-improvement, has announced the availability of copies of two booklets — **NISA Rebuilding Stand-**

ards for Motors and **NISA Rebuilding Standards for Transformers.** Copies of either or both of these booklets can be obtained without cost by writing the Association.

"The Gratelite Story." an eight page brochure which gives complete details on the construction and performance of the sight-saving ⅜ inch cubes in the Gratelite Louver Diffuser, has been published by the **Edwin F. Guth Co.,** 2615 Washington Blvd., St. Louis, Mo.

The **RLM Standards Institute** announces that the 1954 printing of its **"RLM Standard Specifications for Industrial Lighting Units"** is now off the press, and that copies are available without charge to architects, electrical contractors, lighting specialists, utility lighting men, purchasing agents, industrial executives, and others concerned with the buying, selling or specifying of industrial lighting units.

Copies may be obtained without charge or obligation, by writing to: RLM Standards Institute, Suite 818, 326 W. Madison St., Chicago 6, Ill.

A series of five booklets, showing "before" and "after" pictures of installations featuring **Acusti-Luminous Ceilings,** has been announced by **Luminous Ceilings, Inc.,** 2500 W. North Ave., Chicago 47, Ill.

The booklets feature store installations, airline ticket office installations, bank installations, office installations, and drafting room installations.

A new two-color, 16-page bulletin on **open drop-out fuse cutouts** for sectionalizing main feeders, switching transformers, capacitor banks, and other loads has been announced as available from the **General Electric Co.,** Schenectady 5, N. Y.

The booklet (GEA-1816H) shows all ratings of G-E units, how the open-dropout cutout clears fault current, and how the load-break fuseholder breaks load current Also shown are the unit-combination arrester and cutout, and separate and combination mountings. Applications of the cutouts are cited and discussed.

Of interest to everyone concerned with the **motor control problems of the Textile Industry** is a new, eight-page promotional folder just released by **Arrow-Hart & Hegeman.** This attractive, fully illustrated piece gives a complete description of the new Arrow-Hart Type "LM" Loom Switch. Copies may be obtained by writing to the Industrial Control Division, Arrow-Hart & Hegeman Electric Co., 103 Hawthorn St., Hartford 6, Conn.

"when I have to get into my wireways

I'M GLAD I INSTALLED B&C HINGED COVERS!"

Say Plant Superintendents in today's busiest factories

TYPE "HCW"
2½x2½, 4x4, 6x6
1 to 5 foot lengths

FLANKED EXTENSIONS
to match dimensions above - 1 to 5 foot lengths

B&C HINGED COVER WIREWAYS

ACCESSIBILITY *plus* **CAPACITY**

unequalled by any other type of wiring trough

Almost any wiring combination is possible with these B&C Wireways. It's no wonder they're specified again and again by both electricians and plant men. They give greater protection and save time when wiring has to be changed, tapped or spliced frequently. Extensions and rerouting are made simple and easy with B&C Type "HCW" Wireways.

Die formed from heavy gauge steel, as specified by the Underwriters Laboratories and the National Electrical Code. Hard light grey enamel finish. Standard knockouts. Extra rigid construction.

Write for complete catalog data, sizes and specifications.

UL B and C

METAL STAMPING CO.

590 MEANS ST., N. W., ATLANTA, GEORGIA

Your Seals of Dependability and Safety

Technical books

for the electrical man

Alternating Current Machinery Analysis

By Waldo V. Lyon. Published jointly by The Technology Press of Massachusetts Institute of Technology and John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y., 310 pages, $7.00.

The product of more than 12 years of research and reflection, *Transient Analysis of Alternating Current Machinery* offers the first systematic application of Fortescue's method of symmetrical components to the solution of transient conditions in a-c machinery.

The method has long been an indispensable tool in the analysis of the unbalanced operation of polyphase machines and their connected networks. Its applications, however, have been confined to the steady-state behavior of machines. The resolution into symmetrical components has involved the complex representation of alternating currents and potentials and the system constants. Though Fortescue was aware that his method of resolution could also be applied to the instantaneous values of currents and potentials, there has been, until now, no systematic development of this phase of the analysis.

Basing his analysis on the Kirchhoff differential equations that apply to the machine and connected system, Professor Lyon shows how Fortescue's method can be used to determine the transient behavior of polyphase machines under different operating conditions. Of great interest to all concerned with the design and operation of a-c machines and their connected circuits, this book fills an important place in the complete library of electrical technology.

The author, Waldo V. Lyon, has been associated with the Massachusetts Institute of Technology during his entire career. Trained at M.I.T., he joined its teaching staff immediately after graduating (B.S.) in 1905. From 1929 to 1947 he was Professor of Electrical Machinery and at present holds the title of Professor Emeritus. Much of the present book is the result of lecture courses and conferences given to graduate students at M.I.T. during the past 10 years. A fellow of the American Institute of Electrical Engineers, Professor Lyon is widely known for his writings on the subject of electrical machines.

15 Home Lighting Ideas

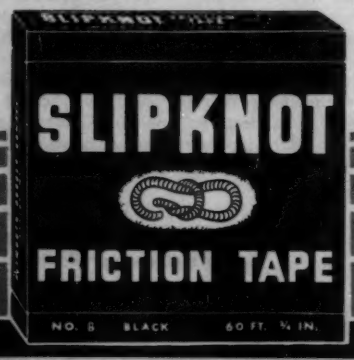
Published by the Publications Office, Illuminating Engineering Society, 1860 Broadway, New York 23, N. Y.; 15 pages; $1.00.

The Illuminating Engineering Society has just published a new packet of Home Lighting Data Sheets for the use of anyone interested in lighting and decoration of residential interiors, and of particular value to residence architects, interior decorators, and utility company home lighting specialists.

Enclosed in an attractive Mauve Decade cover, these data sheets show the latest lighting techniques for a wide variety of home areas,

nothing succeeds like . . . Quality

PLYMOUTH TAPES



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The World's Largest Selling FRICTION TAPE • The World's Finest PLASTIC ELECTRICAL TAPE

PLYMOUTH RUBBER COMPANY, INC.
Since 1896
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complete with construction and installation details. The sheets include excellent photographs to show just how the completed job looks; line drawings and sketches with accurate measurements for custom-built installations; and complete illumination data.

In keeping with modern home design, titles of the sheets include Lighting a Window-Wall; Lighting for a Built-In Sofa; Lighting a Lavatory and Powder Counter; A Remodeled Kitchen with Soffit Lighting; and Lighting for a Laundry.

Based upon the standards of IES, the new home lighting idea packet is the work of the society's subcommittee on residence lighting data sheets. The packet shows how dramatic decoration can be combined with superior lighting effects.

Essentials of Retail Selling

By J. Whitney Bunting, Ph.D. Published by Bookman Associates, 34 East 23rd St., New York 10, N. Y., 137 pages, price $2.50 ($1.50 with paper cover).

This volume is the result of a long-felt need for training material in the retail field. It has been compiled during the past four years with the assistance of educators, business men, store executives, research organizations, and students in the field of retail distribution. Moreover, it embraces the personal experience of the author as both a college professor in the field of retailing and as an executive in a retail store organization.

The basic purpose of the book is to provide a practical introductory text in retail operation. Although all phases of retail selling are presented, emphasis is directed to the personal approach encountered in small or medium size retail establishments. Each chapter is summarized at the end to provide a continuous source or review of major principles covered. Practical supporting photographs, tables, graphs, and charts are used for ready reference.

The style of the volume is such that it will be of great assistance to short courses in sales practice, to high school and college business classes, and to adult vocational programs in vocational education. The book stresses simplicity and a mastery of the elementary principles of merchandise distribution.

Dr. J. Whitney Bunting, author of the book, has for the past 14 years been actively engaged in the teaching of marketing and allied courses. Since January, 1953, he has been president of Oglethorpe University, Atlanta, Ga. Dr. Bunting writes a regular monthly column, *Economic Comment*, for ELECTRICAL SOUTH magazine.

Here's what you want—

right under your nose!

LIGHT & POWER UTILITIES CORP.

Sure, Light & Power fluorescent and slimline fixtures give you quality construction . . . easy, low-cost maintenance . . . and efficient, economic operation. **THEY'RE BACKED BY A FULL GUARANTEE.**

But here's the "something extra" you want for satisfied customers and repeat sales: Light & Power's prompt, dependable service *after* the sale.

Distributed by Wholesale Dealers Only

Write today for our catalog and prices.

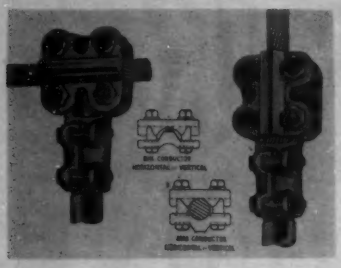
1035 Firestone Blvd. Memphis, Tenn.

New products

(For more information, use coupon on page 72)

Stud connector features application flexibility

ANDERSON BRASS Works, Inc., Birmingham, Ala., has announced their new "Universal" Type DSCT Stud Connector, a versatile multi-purpose



connector, ruggedly designed for wide conductor ranges and applications.

These new connectors may be stocked for use with tubing and cable for straight or 90 degree connections. The clamping cap is square, permitting rotation of 90 degrees or reversal, thus providing copper cable ranges from No. 2 solid to 800 MCM and copper tubing ranges from ⅜ inch IPS to ¾ inch IPS.

Seven stud sizes are available from ½ inch through 1½ inches in diameter. The application flexibility of this type fitting makes it ideal stock for emergency use where specific connector requirements cannot be anticipated.

"Universal" Type DSCT Stud Connectors are cast from electrical bronze and furnished with hex head silicon bronze bolts, nuts and lockwashers.

For additional data, circle item 801 *on the handy coupon on page* 72.

Area island lights ideal for recreation

A NEW RECREATION area island light has been announced by Magni Flood, Inc., 38 N. Second Ave., Mt. Vernon, N. Y. The new unit features 24 gauge steel construction with a 16 inch diamter, porcelain vitreous enamel, corrosion resistant, reflector.

The unit is built for beauty as well as strength and is available in red, green, blue and white. The manufac-

turer states that other colors are available upon request.

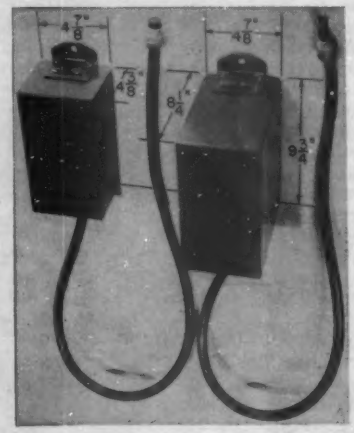
Installation and wiring for this unit is simplified. The medium base lamp burns down, and the entire unit slips on to a 1½ inch or 2 inch pipe. The unit is designed for greater strength and longer lamp life.

For additional data, circle item 802 *on the handy coupon on page* 72.

Weatherproof capacitors feature compact design

A NEW LINE of weatherproof capacitors for outdoor or indoor application on 460-volt distribution systems is available from the Westinghouse Electric Corp.

Compact design in a wide range of ratings makes the new capacitor



ideal for power-factor improvement on isolated installations, such as oil field and irrigation pumping motors. When connected on the load side of the motor starter, there is no need for a separate switch.

Aluminum-case construction provides permanent protection against corrosion or atmospheric conditions. A flexible cable allows in-

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EMT-CONDUIT
and
SERVICE CABLE
STRAPS

Quality,
Never a Compromise
W. W. CROSS & CO., INC. — JAFFREY, N. H.
GENERAL SALES AGENTS
J. J. WALSH & CO. — GREENVILLE, R. I.

stallation by direct or conduit connection.

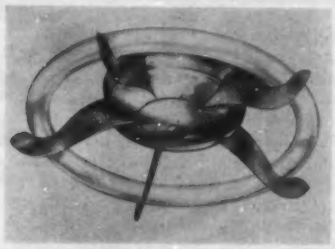
All units are 3-phase, 460-volts. The smaller unit is rated at 2 and 3 kvar; the larger at 4, 5, and 6 kvar. The capacitors weigh from 10 to 25 pounds.

For further information, write Westinghouse Electric Corporation, Box 2278, Pittsburgh 30, Pa.

For additional data, circle item 803 on the handy coupon on page 72.

Circline lighting fixtures eliminate ceiling shadows

ANNOUNCEMENT has been made by the Carter Lighting Co., Chelsea 50, Mass., of its new line of circline lighting fixtures, designed for "lighting in the modern manner." One of the features of the new line is the



perforated steel louvers, which are utilized not only as lamp supports but also as an effective means of obtaining a low brightness effect.

Typical of the new features is the "Halo," an eye-appealing and efficient unit designed to incorporate the wide-diameter 40-watt lamp. The unique design of the "Halo" eliminates ceiling shadows without cutting down on lighting performance.

All Carter circline fixtures are available in baked white enamel with chrome center ornament, or in all-chrome. The louvers are finished in aluminum grey. Instant-lighting ballasts are UL approved.

For further details, an attractive and informative catalog is available upon request from the company.

For additional data, circle item 804 on the handy coupon on page 72.

Cable finish makes installation easier

INSTALLATION of nonmetallic-sheathed cable has been made easier by a smoother, cleaner surface on new Silver Dutrax manufactured by Anaconda Wire & Cable Co., Hastings-on-Hudson, N. Y. Tests show that Silver Dutrax can be pulled through joists with half the effort necessary when pulling ordinary nonmetallic-sheathed cable, and stained and soiled hands are a thing of the past.

Silver Dutrax Type NM will not become sticky. Storage in cartons for

NORTH, SOUTH, EAST, WEST,

CAVALIER ELECTRIC HEATERS SELL BEST!

Electrical contractors and dealers all over the country report heavy and steadily mounting sales on Cavalier Automatic Electric Heaters. Northwest Electric Supply Company, Portland, writes:

NORTHWEST Electric SUPPLY COMPANY

712 S.E. SEVENTH AVENUE
PORTLAND 14, OREGON
Fillmore 8361

April 20, 1954

Cavalier Corporation
Chattanooga 2, Tennessee

Attention: Melvin O. Wessel

Dear Mr. Wessel:

We are looking forward to bigger things with Cavalier in '54 than ever before. Our sales record of Cavalier heaters in the Northwest indicates that the future for Cavalier electric heat is unlimited.

In 1953 our sales increased 21% over 1952. We are anticipating an even greater increase for 1954 because power companies in our area recently removed demand metering which imposed an undue cost-of-operation burden on electric heat users.

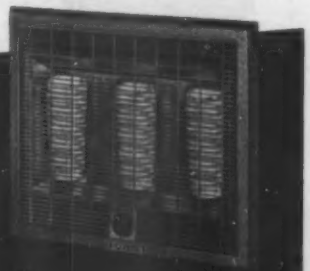
Last year our electric heater sales accounted for nearly 10% of our gross supply business. In addition much electrical wiring material is sold as a result of our heater sales.

So you can see why we expect to sell more in '54 than ever before.

Yours very truly,

NORTHWEST ELECTRIC SUPPLY CO.

G. W. Exel



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Wall Insert, Surface Mounted, Portable, Full Chrome Finish Wall Insert, and Non-automatic Bathroom Heaters, and Floor Furnaces.

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Please send, without obligation, additional information on new products circled: 801 802 803 804 805 806 807 808 809 810 811 812

Name ..... Position .....

Company Name .....

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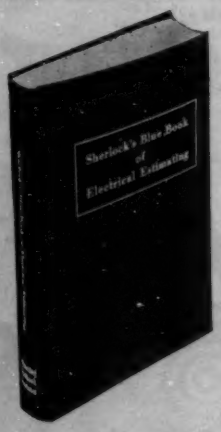
City ..... State .....

three days at 170-deg. F. demonstrated no appreciable stickiness, not even when the coils were cooled down to 70-deg. F. to determine whether the layers of cable would stick to each other. The cable, throughout, was tack-free; the layers were free from each other; the coil was easy to feed out. Field installations by contractors in temperatures up to 90-deg. F. confirmed results achieved earlier under extreme conditions "manufactured" in the laboratories.

Low - temperature characteristics of the cable were thoroughly investigated in similar manner. The cable was first stored for three days at temperatures ranging from zero-deg. F. to minus 25-deg. F. Cable was then pulled through wooden joists at zero degrees. No difficulty was encountered. Moreover, the finish did not flake off nor peel in use—and it



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This book is easy to use—it has no complicated mathematics or formulas to work over. You merely determine the nature of the wiring, check it in the BLUE BOOK OF ELECTRICAL ESTIMATING and there's your answer—it's the simplest estimating book ever written.

See It 5 Days Free
This book was written by a successful electrical contractor and estimating engineer with over 20 years' experience. It has an entirely different method of determining estimates on wiring jobs. Electrical contractors, journeymen, architects, and engineers will find use for this book every day. Gives time required to do jobs along with complete labor charges in every state in the country. Order this book now from your supplier at special introductory price of $7.75, or send coupon below.

Dealer inquiries invited.

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Send me the NEW BLUE BOOK OF ELECTRICAL ESTIMATING for 5 days free trial. I understand I may return the book within 5 days and owe nothing. If I keep it I will pay $7.75 plus postage for shipping.

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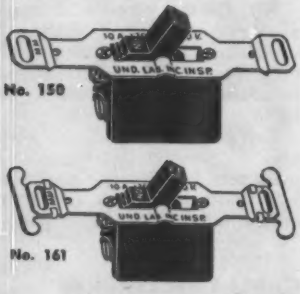
be *SURE* . . . be *SAFE* . . . choose

MASSEY WIRING DEVICES

Toggle Switches with plaster ears



MASSEY Toggle Switches are UNDERWRITER'S LAB. APPROVED and meet Federal Specifications No. W S890. Illustrated are No. 150 and 161, single pole switches, rate 5 amp. 250 V, 10 amp. 125 V. Available in brown and ivory. Complete with large head 6/32 screws. Boxed for counter and shelf displays.

Write for Complete Catalog

A. H. MASSEY, INC.
P. O. Box 206 Derby, Conn.

did not mar wall surfaces.

The new, improved nonmetallic-sheathed cable strips easily and its smooth outer finish allows easy fishing. The uniformly-small diameter makes it especially good for wiring in existing buildings.

Silver Dutrax Type NM is available in twin-conductor in sizes Nos. 14 to eight AWG and in three-conductor round, in sizes Nos. 14 to six AWG Standard lengths are 250-foot coils for sizes Nos. 14, 12 and 10, and 125-foot coils for sizes Nos. eight and six AWG.

For additional data, circle item 805 on the handy coupon on page 72.

Rubber connectors permit easy entry

SIX NEW ADDITIONS to the rubber industrial line of the Rodale Manufacturing Co., Inc., Emmaus, Pa., have just been announced by the company. Newly-designed and especially adaptable for use in industrial plants and garages, the devices are right

angle rubber industrial connectors and caps with metal cord grip clamps.

Pictured is Catalog No. 553 and Catalog No. 563, a male and female combination for parallel blades. Also available are cap and conector combinations for "T" Polarity Blades (Rodale Cat. No. 554 and 564) and 3 pole blades (Rodale Cat. No. 559 and 569). All combinations of these right angle connectors are rated 10A/250V, 15A/125V, and cord holes measure .625 on all six caps and connectors.

Caps are designed with a small hole on the side to permit easy entry of grounding wire for use with 2-wire receptacles. In use, the design of the cap enables the cord to remain flush with the wall.

For additional data, circle item 806 on the handy coupon on page 72.

Switch box affords greater wiring space

A NEW FRONT MOUNTING, nail-up switch box, No. 9000-F, has been announced by the Union Insulating Co., Inc., P. O. Box 351, Parkersburg, W. Va. The new box features a "plaster-seal" which keeps plaster from device screw holes. A thin molded flash is easily removed w th a screw driver.

ARRO ARRO ARRO ARRO

You, too, will put your stamp of approval on the Arro line when you use any of Arro's devices for solving your drilling and anchoring problems.

See your industrial, hardware or electrical supplier

ARRO EXPANSION BOLT COMPANY

1520 Boone Ave., Marion, Ohio

The front mounting bracket instantly locates box for depth with convenient front of stud nailing. One nail driven in the face of the stud mounts box rigidly. Knockouts are removed quickly and clean with screw driver blade.

Box depth adjustment is made easy by ⅝ inch and ½ inch spacing lines on ends of the box; ¾ inch spacing for wet walls provided by "C" bracket tips. No external projections, box cut-outs in rock lath or plaster board greatly simplified since there are just four straight cuts. Greater wiring space in ends of the box accommodates overside devices and provides extra wiring room for wires where it is needed most.

Further information on the UL approved No. 9000-F is available from the company.

For additional data, circle item 807 *on the handy coupon on page* 72.

New fluorescent unit accommodates air diffuser

A NEW FLUORESCENT lighting fixture for large area lighting applications has been designed by Gruber Lighting, 125 S. First St., Brooklyn 11, N. Y., to accommodate an air conditioning diffuser in its center. This unit, measuring 61-inches square, utilizes 24 fluorescent lamps in its inverted pyramid, Alba glass shielded body.

Designed for surface mounting, the unit has a 24-inch by 24-inch opening through its depth, with the lamps arranged in tiers on the four sides of

this opening. This opening provides insertion of standard dimension diffusers used with air conditioning ducts.

The large unit, with its heavy concentration of light output, affords high illumination intensity even when mounted on wide spacings. The sloping sides of the unit effect a diffuse, widespread light distribution, with a maximum of visual comfort and freedom from direct glare as a result of the shielding medium.

Although this versatile fixture is well-suited to many applications, either singly or in groups depending upon the area to be lighted, it is particularly pointed to uses in commercial and institutional interiors of very large area.

For additional data, circle item 808 *on the handy coupon on page* 72.

New L-M guy insulators use tropical mora wood

LINE MATERIAL CO., Milwaukee 1, Wis., has announced the design and manufacture of new wood guy insulators using mora wood instead of the usual Douglas fir. Mora is a tropical wood having unusual density and resistance to decay, fire, and moisture absorption. It has demonstrated its high mechanical and electrical strengths under tests at L-M laboratories. Taking advantage of mora's resistance to fire and moisture absorption, L-M has designed the new insulators without arcing horns. Thus, neater and safer guyed structures are now possible.

New insulators are available with ultimate strengths of 15,000, 25,000, or 35,000 pounds in several voltage classes. The 15,000-pound units are manufactured for voltage classes 23 through 69 kv; the 25,000-pound models, 23 through 161 kv; and the 35,000-pound models, 69 through 161 kv. The 35,000-pound insulators have two rollers side by side at one end;

BE Sure with CORNISH

replacement cord sets

for Lamps, Radios, Small Appliances

6-, 8- and 10-ft., 18/2 type SP-1 brown cord, with molded-on plastic plug. Appliance end stripped ¾" Hanked, with UL Green Cord Set label applied.

for Vacuum Cleaners, Small Tools, Mixers, etc.

6-, 10- and 20-ft., 18/2 type SV black cord, with molded-on plug. Appliance end jacket removed 2"; conductors stripped 1". Hanked, with UL Green Cord Set label applied.

for Trouble Lights, Small Motors, Tools, etc.

6-, 10- and 20-ft., 18/2 16/30 SJ black cord with molded-on plug at one end. Appliance end jacket removed 2"; conductors stripped 1". Hanked, with UL Green Cord Set label applied.

heavy duty extension cord sets

for Washing Machines, Refrigerators, Fans, Business Machines, Small Motors, Lawn Mowers, Hedge Trimmers, Portable Tools

CORDS Quality-controlled in convenient lengths for fast and profitable over-the-counter sales.

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CONTOURED BRUSHES for

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whereas the 15,000- and 25,000-pound units have a single roller at one end. Each mora guy insulator is designed to provide an impulse strength approximately twice the BIL of its rated voltage class.

For additional data, circle item 809 on the handy coupon on page 72.

Extension cords packed in individual cartons

A NEW CATALOG sheet now available from Royal Electric Co., Inc., Pawtucket, R. I., emphasizes new individual corrugated cartons for the company's line of "Powr-Kord" heavy-duty extensions. The new cartons, in various sizes for the many

sizes and lengths of cord in the line, are attractively printed for display purposes, and are rugged enough to be used by owners for storing the cords when not in use.

The full "Powr-Kord" line comprises 22 extensions, from 15 to 150 feet long, of Royal rubber-jacketed Type S and SJ cords, up to size AWG 14. Heavy-duty rubber caps and connectors, with built-in strain reliefs, are molded to the cord to insure both safety and long life.

They are fully listed by UL; the Underwriters' Blue Label is attached to each cord.

For additional data, circle item 810 on the handy coupon on page 72.

Rheostat incorporates new design features

A NEW 300 WATT ring rheostat incorporating several interesting design features has been added recently to the rheostat line of Ward Leonard Electric Co., Mt. Vernon, N. Y.

These new Bulletin 1116 Vitrohm Ring Type Rheostats are for use in ac and dc circuits where smooth, accurate current control is essential. They are particularly useful where "stepped" rheostats do not furnish sufficiently close adjustment. Typical control applications include: generator and motor field, electron

MARCUS dry type TRANSFORMERS ...power this "Electronic Brain"

MARCUS 100 KVA 3 phase transformer powers *UNIVAC*

As the power source of Remington Rand's famous *UNIVAC* (Universal Automatic Computer), MARCUS TRANSFORMERS perform their valuable function within this Electronic Brain.

Every MARCUS dry-type Transformer . . . whatever its class and for whatever its purpose, is constructed to far exceed its particular specification demands. Every detail and component of MARCUS dry-type transformers is carefully engineered for *longer life* and uninterrupted trouble-free performance!

MARCUS Series 5000 dry-type "Class B-plus" Transformers are designed to exceed specifications by approaching "Class H" insulation, yet operating at "Class B" temperatures.

Capacities from 1 to 3000 KVA

- DISTRIBUTION
- GENERAL PURPOSE
- UNIT SUBSTATION
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- RECTIFIER
- WELDING
- MOTOR STARTING
- SPECIAL

CHECK THESE MARCUS B-PLUS FACTORS FIRST!

- *Higher Dielectric Strength!*
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PIONEERS IN THE FIELD OF DRY TYPE TRANSFORMERS

tube, battery charging, oven and lamp dimming control.

Base and core consist of high grade, high dielectric strength ceramic. Vitreous enamel bonds the base to the core and permanently

locks the special alloy resistance wire in place.

Contact arm assembly features: balanced steel arm equipped with two sintered, self-lubricating copper graphite shoes; heavy compression spring, housed in a cold molded insulator, maintaining uniform contact shoe pressure on resistance winding and collector ring; and a corrosion resistant, 3/8 inch diameter steel shaft, which turns in a self-lubricating sleeve bearing.

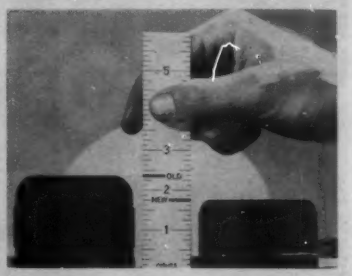
Dimensions: six inches in diameter; back-of-panel depth only 2 3/16 inches. Resistance values range from 1 to 2500 ohms. 300 watt rating based on 300°C rise. Tandem mounting, tapered windings and other non-standard features available on special order.

For additional data, circle item 811 *on the handy coupon on page* 72.

Smaller, lighter ballast provides easier mounting

A NEW shallow-height, brick fluorescent ballast which is smaller and lighter than previous models has been announced by the General Electric Company's Ballast Department.

The new ballast, for switch- and rapid-start types, has a nominal height of 1¾ inches and is approxi-



mately 10 per cent lighter. Its long smooth side panels facilitate heat dissipation when in contact with the fixture wiring channel.

Ballast leads extend through elongated slots located ¼ inch from the base and halfway between the center mounting slot and the corner mounting holes. This lead arrangement provides easier mounting independent of type of mounting used, according to G-E engineers, and the leads cannot get in the way of tools used for mounting.

For additional data, circle item 812 *on the handy coupon on page* 72.

Quality wiring

(*Continued from page* 20)

a price on a wiring job, Hauser tells him frankly and courteously that if he's just looking for a "price" in a wiring job to see someone else.

One of the more recent jobs handled by Hauser Electric was a Virginia Beach motel. Hauser's got the job for $14,000 because of the firm's reputation. The competitive bid was $2,700. This particular job included three circuits, color-coded, and electric heat in all units of the motel, including remote control wiring throughout. Mr. Hauser sold the owner on doubling his actual present need and installed wiring on this basis. Before the motel was completed the plans were changed to include laundry equipment, which almost took up the slack, and now the owner plans to add a restaurant which will push his electrical requirements near the maximum load. This is just one of many examples that Mr. Hauser can show you of why he believes in "doubling the present need."

A great booster of the "all-electric" home, Mr. Hauser's increased labor efficiency now enables him to offer electric radiant heating installed in the ceiling and air conditioning to the home builder for the same price that they normally would pay for "wet" heat alone.

Hauser's heating engineer, Melvin E. Manuel, a Virginia Polytechnic Institute graduate, figures each job accurately. Mr. Manuel is "super insulation" conscious, Mr. Hauser says, and as a result, the firm's electrically heated homes are being heated cheaper than homes are being heated in the TVA area, according to Mr. Hauser.

The firm moved into its present attractive business headquarters in July, 1953, and they are well pleased with their suburban Norfolk location. The showroom is beautifully arranged and features 42 circuits in the fixture display room. On display is everything from the most expensive chandeliers to the most inexpensive, small hall fixtures.

Mr. Hauser says that the maintenance of such a display is rather expensive but that it is a necessary expense and pays off in the long run.

"People who are building nice homes like to be able to pick their fixtures," Mr. Hauser says, "and we always try to have as large a selection as possible for them to choose from."

Occasionally the firm has a customer who desires to install expensive chandeliers at the expense of the wiring installation, but Mr. Hauser makes every effort to get them to put this money into extra wiring and then add the chandeliers at a later date when they can afford it.

There are numerous other sales hints that the Hauser organization uses in pushing quality wiring. In selling electric heating, Mr. Hauser, and the numerous architects who now join him in "preaching the gospel" tell the home builders that a "cost is a cost," and $1,000 spent

Keeps Lamps Cooler, Cleaner, Longer

Air automatically circulates around the lamp and through the slotted neck of the ABOLITE Reflector to keep dust and grime from settling. Lamp and reflector surfaces stay cleaner twice as long. There's less maintenance; 7% more up-light.

LONGER LAMP LIFE

Constant air circulation in ABOLITE Reflectors keeps lamp necks 40°F. cooler, provide maximum lamp life.

WHITER THAN WHITE

Floods More Light

ABOLITE Titanium white porcelain enamel finish reflects maximum light — provides highest lighting efficiency.

There's an ABOLITE for every lighting requirement . . . ask your jobber for complete details.

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THE JONES METAL PRODUCTS CO.
WEST LAFAYETTE, OHIO

on installing an electric heating system will save several thousand dollars in comparison to numerous other types of heating installations —a saving that would take many, many years to realize from a fuel saving standpoint.

"Electric living is just beginning," Mr. Hauser states emphatically. "With the potentialities of atomic power around the corner, people will soon be able to secure the services of their most useful servant cheaper than ever."

Several things that the firm is now on the look out for include double - oven range installations, where they have found No. 8 wire inadequate and planned installations of color television receivers, which use approximately three times the amount of electricity as the present black and white TV sets.

Even in their "super" three wire systems, the Hauser firm has found that adequate circuiting is necessary, and they will not supply more than six outlets on a circuit. One of their policies is to have an outlet "anywhere you can stoop" and the average Hauser-wired room has 12 outlets.

Another practice that has proved successful and helped to build the Hauser reputation in Norfolk is their plan of "approved" appliances. They know that the electrical contractor a good many times has to take the blame for a faulty appliance, and they test every appliance line, every item in the line, as each year's new models are put on the market. Then, through results of such tests, they recommend appliance purchases to customers.

Wide range of activities

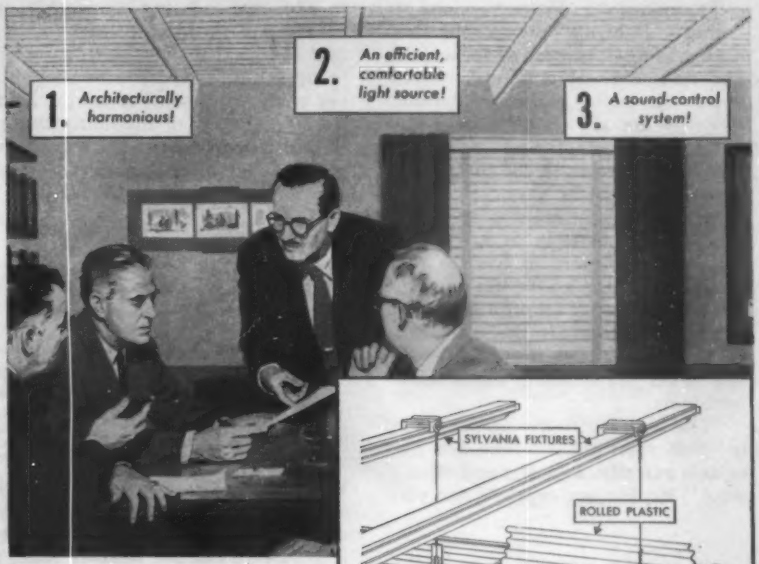
Mr. Hauser is of the opinion that the electrical contractor today should begin to take part in every phase of the business. The time has come, he says, for the electrical contractor to begin taking back this business that has been taken from him by the furniture and hardware stores and others who have and are making inroads into the business. With this in mind, the Hauser firm also specializes in high - fidelity taped music systems, and have made a number of profitable installations of this nature in hotels, banks, restaurants and other institutions. The firm also specializes in custom range and oven installations.

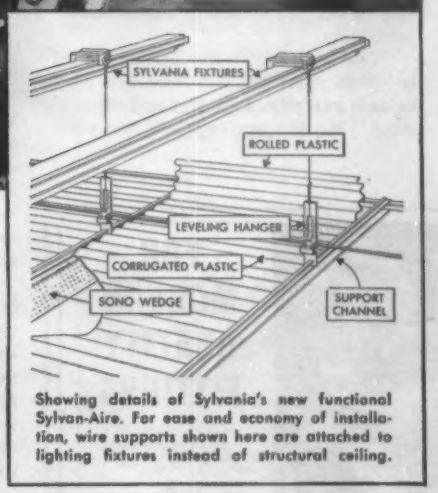
In selling electric heating the Hauser organization stresses the fact that with this method the home owner will never have any

Another Sylvania Achievement

SYLVAN-AIRE

A three-way functional treatment of beauty — sight — sound





Showing details of Sylvania's new functional Sylvan-Aire. For ease and economy of installation, wire supports shown here are attached to lighting fixtures instead of structural ceiling.

Display this nationally advertised emblem which identifies you as the Sylvania Qualified Lighting Contractor in your vicinity.

Adaptable! Easily Installed! Economical!

You never saw a more fascinating or a more functional system of sight and sound control! It's engineered by Sylvania to serve 3 ways!

1st . . . it has the beauty and character of continuous corrugated white plastic.

2nd . . . it is a source of soft, eye-pleasing over-all lighting.

3rd . . . its inconspicuous V-shaped "Sono-Wedges," lined with thick glass-fiber pads, deaden noise . . . reduce distracting sound to comfortable levels.

In addition, the corrugated form of the plastic permits air to circulate along the supporting channels. Thus *air-conditioning* also can be effectively introduced.

Flexible in Design!

Sylvan-Aire's light weight and flexibility of design permit it to be readily and economically installed in any conference room, office or working area. Be sure to show your architectural and building customers this latest Sylvania achievement. For full details write today to Dept. 4X-2508 at Sylvania.

SYLVANIA

2520 Oakville St., Alexandria, Va. • 660 Murphy Avenue, S. W., Atlanta, Ga.
100 Fordyce St., Dallas 2, Texas

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drape, curtain or placing of furniture worries. These, and other sales methods have enabled them to have the distinction of selling more electric heat than any other contractor outside the TVA area. Over a two year period, according to Mr. Hauser, his firm has made over 800 electrical radiant heating installations.

Typical of Mr. Hauser's ideas on "quality lighting" is the fact that he uses only the best of materials. For example, in a Hauser wired home, lifetime, platinum contact switches are always used throughout. "We preach cutting out all the frills and putting in all the essentials," Mr. Hauser says.

Mr. Hauser attributes the success of his business to salesmanship. All members of his 15 man organization are above the average in appearance, intelligence and moral character. He pays his employees well above the union scale and never has to worry about labor problems.

"The way I hire my personnel is to pick men that I feel are my equals morally, socially, and otherwise," Mr. Hauser says. "When you find men of this sort, don't worry about whether or not they have experience in the electrical field. You can teach a man the trade, but you can't teach him these other things."

One other little profitable hint that Mr. Hauser has to pass on is the business of replacing lamp and other appliance cords. He says that in addition to being a necessity in assuring a thoroughly satisfactory and thoroughly new wiring job, it is something that almost any member of the organization can do. And, this is only one of the many things that Hauser Electric insists upon in the high standards they have set for modern home wiring.

Heat pumps

(*Continued from page* 34)

Mr. Payne designed the air conditioning on the basis of 95 degree dry bulb, 78 degree wet bulb which is characteristic of the Fredericksburg area.

As previously pointed out, 17 Weathertrons were installed, each of 5 ton capacity, giving an installed capacity of 85 tons of refrigeration. On the heating side, a special type of supplementary heater was installed with each machine.

Both the air intake and exhaust opening on the outside of the building will later be dressed with louvers to enhance the outside appearance and provide protection against rain, wind, etc. The units were installed with a 4 to 5 inch area between the Weathertron and the outside wall.

The actual installation of the units was accomplished by a total of four people. An average of one unit per day was trucked to the building, set in place and installed. In other words, the were installed in less than three weeks with only four people, two of whom were skilled in the installation of the equipment.

Textile mill problems

(*Continued from page* 31)

were given as the cause, other than being fitted too loosely. However, we still continued to have the same trouble. After the warranty period was past, we found that we could bore and bush the brackets at less expense than we could buy new ones and also get the desired bearing fit.

So far, I cannot recall a single bracket having been changed on these motors where we have fitted them snugly instead of leaving enough clearance for them to creep. We have changed approximately 60 per cent of these brackets so far and are still in the process of bushing the others as they become noisy.

Motor drying

When a motor is wet for any reason, it should be dried out thoroughly before being put back in operation. The best method of drying is in an oven designed for this purpose. There are times, however, when we have motors that cannot be spared long enough to be oven dried or we may have more motors involved than can be dried in a reasonable length of time, due to limited oven space.

When we have an emergency such as a number of motors being wet down in a spot that will shut down production, other methods have to be used for drying. There are a number of ways to dry motors by external heat, such as strip heaters, heat lamps, and forced hot air being heated from steam coils, electric heaters or hot air furnaces. These methods are usually slow and costly. The internal heating method, in my opinion, is the best method to use when there are several motors involved and it is necessary to get them back in service in a minimum of time. By applying one-fifth of the rated voltage to a motor, preferably from an ungrounded source, the temperature rise will be slow enough to dry the coil insulation without damage from vapor or gases generated inside that might cause rupture of the insulation. This kind of drying should be done under close supervision. The application of one-fifth of the rated voltage will usually cause a current in the windings of a little more than full load current as the drying is being done under locked rotor conditions.

If faster heating is desired, it can be done by removing the rotor which will increase the current in the stator coils. Where single phase voltage is being used to dry three phase motors, the voltage should be continually alternated between phases to maintain more even heat in all the sets of coils. This heating should be continued until the insulation resistance has raised to at least one megohm for motors up to 550 volts.

For higher voltage motors, the resistance should be at least one

megohm per thousand volts. When the insulation resistance has increased to one megohm, the motor can then be put on rated voltage and left running until such time as it is put into operation or has completely dried from its own heat.

Switches and starters

The maintenance of switches and starters never ceases to be a problem in the textile industry. The use of general purpose enclosures throughout the plants presents the problem of keeping them clean. The NEMA 1-A enclosure now being used is helping this situation to a great extent, but as long as we have a large percentage of general purpose enclosures, the cleaning problem will remain with us.

The problem of keeping switches and starters clean has not been solved but can be controlled to a certain extent by routine periodic inspection and cleaning schedules. Cleaning can be done by compressed air or vacuum and wiping with a dry cloth. The dust accumulations within the enclosure will decrease the radiation of heat from the current carrying parts, bind the moving parts and tend to cause flashover of the live parts due to accumulation on insulator blocks.

Tightening connections

All connections in the switches and controls should be checked regularly and kept tight. Alternate cooling and heating as well as vibration will loosen nuts and screws.

Contacts should be checked regularly and if worn or burned badly should be replaced. Care should be taken to see that contacts all make up at the same time and that the contact pressure is sufficient. Contact pressure is more important in controls than the contact area. If necessary to dress copper contacts, always use a fine file. The use of abrasive cloth and paper should be discouraged because they may leave non-conducting particles on the contact surfaces.

Importance of oiling

The mechanical operation of the switches and controls should be checked for proper operation. All parts should operate freely and if any tightness or binding is detected, this should be corrected.

Wear and friction in controls may be overcome by proper lubrication with a light oil on operating parts, being careful not to use excessive lubrication.

Arc chutes or barriers should be

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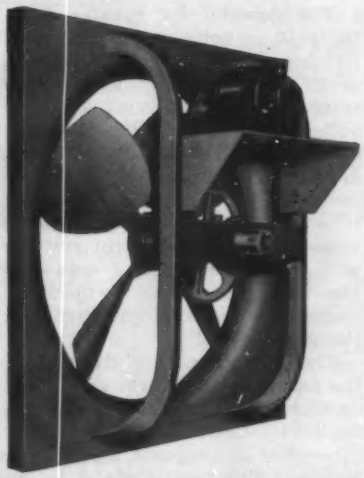

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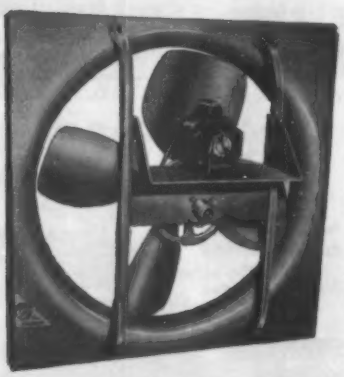

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checked and if found to be burned badly or broken should be replaced. This will prevent flash-over and possible badly burned pole pieces.

All overload protective devices that are incorporated in the controls should be tested for proper operation to be sure that the control will disconnect the motor on an overload as it is designed to do.

Reducing loose connections

Loose connections are a constant problem. Most of these cases can be attributed to the human element that is involved. Most of the difficulty experienced with the solderless joints is due to improper cleaning and tightening of the joint when it is made. Some difficulty, however, is caused from expansion and contraction, due to constant heating and cooling or vibration.

The use of compression connectors and terminals has helped reduce the loose connection problem on the small conductors.

When soldered joints are used on large or small conductors, the lack of skill in making the joint is usually the cause of a bad connection.

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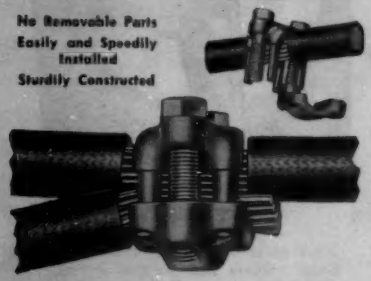

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Loose connections in controls and control circuits are especially bad as there is usually such low current that it will give intermittent trouble and will not heat the connection and make the trouble show up. A high resistance connection in some controls will cause spasmodic operation and is very hard to trace.

In general, a connection, or any work for that matter, is no better than the man who does the work. This is the key to most maintenance problems—properly trained electricians who take pride in their work.

Wiring modernization

(*Continued from page* 29)

The Code (Article 450) has regulations for effecting the economics brought about by carrying high voltage equipment close to the industrial load. This is another example of higher voltages. Because dry-type and askarel-insulated transformers are safe, high voltage can be brought into the industrial plant and carried to the load centers.

Low voltage systems

The demand for greater flexibility in switching and control of lighting units and of other appliances is being met by low-voltage relay systems employing about 25 volts (Article 725). While the increasing loads of the next ten years are likely to be supplied by higher voltage systems, yet at the same time it is to be anticipated that these low-voltage control systems will come into greater use. The low-voltage relay scheme opens up many new control applications for the years ahead.

The main purpose of this part of the panel presentation was to demonstrate that the people responsible for the Code have been and are interested in adequate wiring. The National Electrical Code is by no means a limiting feature in our expanding business. The Code does keep pace with the growth of our industry. At present one Code-Making Panel is studying an Interim Amendment to the present Code on the subject of room air conditioners. This is expected to provide the necessary additional provisions soon without having to wait for the next edition of the Code in 1956.

What's ahead in Code affairs regarding more power ten years hence? The Code-Making Panels and Special Technical Sub-Committees are continually discussing new developments. A very thorough review is now being made to ascertain that the Code rules governing insulated conductor assemblies in metal raceways are adequate and proper. This study should insure that these wiring systems will be installed to best advantage for the carrying of ever increasing loads. It is anticipated that the results of this investigation on cables in conduit will be incorporated into the next National Electrical Code, along with the many more advances which are bound to be brought about by the never-ending development of our industry. Expanding concepts of utilization have been, are and will be provided for in the National Electrical Code so as to keep abreast of the continually increasing consumption of electrical energy.

New raceway

(*Continued from page* 27)

building's manufacturing area, but the machine shop, the warehouses, and the oil storage area as well.

The Surfaceduct supports industrial RLM fixtures by means of rigid pipe stems, in addition to accommodating the fluorescent fixtures.

Job appraised

How well the installation has worked out for Fitler is told by A. T. Gibson, who said, "With this installation we have been able to give the Fitler Company a modern, flexible, and more rugged job at no increases in cost over the ordinary type of lighting installation. Installing the system was as easy as ABC."

Architect Main, after finishing the plans for this New Orleans factory, issued a set of plans for a building at Indianola, Miss., which incorporates this same plan, and rejects the messenger cable system he had used prior to the Fitler building layout.

Two-way radio

(*Continued from page* 23)

her desk. The call comes through the loud speaker for her to hear even when she is waiting on a customer. If the conversation must be private, or if quiet is desired in a salesroom full of customers looking at fixtures, she picks up the re-

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ceiver, and the call then comes through it, for her ears alone.

Even when the office is closed and the dispatcher is off duty, calls can be made from car to car.

"Two-way radio makes it possible for me and my partner to be in two places at one time," Mr. Fewell said. "We two spend most of our time in the field, making estimates and supervising jobs. Before we had two-way radio service, we were out of contact with the office."

The service made possible by two-way radio sometimes has spectacular results. Recently an industrial customer called for an emergency repair. Mr. Fewell has charge of all industrial and commercial work, and the radio dispatcher reached his station wagon immediately. One minute later, he faced his customer. The station wagon had been in the next block.

"When I came in," he grinned, "my customer thought he was seeing my ghost."

Every day the value of two-way radio is demonstrated at the Broadmoor housing project, where wiring is supervised by Windle Price. A large wall chart of the project is maintained by C. B. Young, engineer and buyer. Using colored pins, he marks the location of every job in progress, the location of every truck on the job, and even the status of the job, whether it is just being started or is nearly finished.

When material is needed, a call from the truck goes to the office, and in a few minutes Engineer Young has the delivery on its way.

But it is rare that a truck has to return to the plant for material or to call in for it. Each truck is equipped for the job it has to do.

The Price-Fewell radio station operates clearly within a radius of thirty miles, an area large enough to care for most customers. No change had to be made in the trucks' generators. The amperage pulled by the mobile radio unit is equivalent to only one headlight.

"People expect a contractor who is modern enough to have his trucks equipped with two-way radio to have a good-looking display room for fixtures." Fewell pointed to the knotty pine walls and to the plant boxes that decorate several spots in the showroom and form an unusual background for display windows.

The rest of the building also is worthy of comment. Every part was planned for future growth. Behind the showroom is the assignment room, where the electricians meet each morning. Behind this is their own spacious restroom, equipped with lounges, cold drink, candy, and cigarette machines. The rear of the building, an area measuring 100 x 75 feet, provides roofed parking space for trucks. A side drive-in gives access.

The vacant ground around the building has been made into a smooth green lawn, kept in perfect condition by a gardener. Evergreens and flowers make an attractive border.

"Our growth is faster than ever since we installed two-way radio," Mr. Fewell said. "We'll need that unused ground, for we're soon going to have to hire more men and buy new trucks."

Earl Fewell and Windle Price have had a career that should interest any electrical contractor. Seven years ago they were employed by the local power company. When they agreed to form a partnership, they each borrowed $500 and bought one truck. Operating as electrical contractors from Fewell's back porch, they soon needed to hire two apprentices and to buy another truck. Within a few months they had their first business building. Within three years they had moved three times to larger buildings. Now their property includes a separate warehouse, stocked with thousands of fittings and materials for large industrial jobs and the finest homes in the area.

"In all of the seven years we have operated and expanded," Mr. Fewell concluded, "we have never encountered an aid to efficient and economical operation that matched our two-way radio service. What it has done for us in six months is almost unbelievable. Our electricians like it. It saves their energy, and it saves them annoyance. Our customers, both industrial and homeowners, are impressed with it. We're the only electrical contractors in the state who have it, and we're being discussed from one end of the state to the other.

"Yes, we're getting jobs far beyond our 30-miles clear range. But the heart of our operation is in Pulaski County, and that is where we must save and conserve time. Two-way radio does that for us."

Electrified building

(*Continued from page* 25)

all floors for Musak, with IBM controls, an innovation in office buildings, though common in restaurants and some other public places. Electronic clocks, also controlled by IBM, have been installed throughout the building. More ornamental than utilitarian are 26 planting beds scattered throughout the building, but mainly in the large reception room on the second floor, private offices and the cafeteria. Each of these is lighted by a Par flood bulb, which not only gives the effect of sunlight but serves as a substitute for sunlight for plant sustenance.

A circuit breaker type terminal panel has been installed on each floor, with a master panel in the basement, for control of the required 2,500 ampere, 120-208 volt current flow.

The electrical design for the building was prepared by Tribble Lee & Associates, Jacksonville. J. W. Bell was project supervisor for the Stinson Electric Co. Air conditioning equipment was installed by Henley & Beckwith, Inc., Jacksonville.

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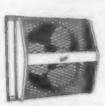

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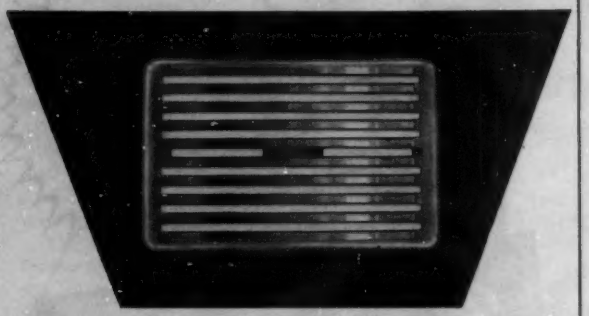

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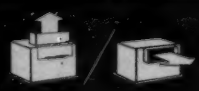

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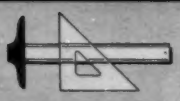

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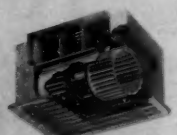

425 CFM
300 CFM
100 CFM

CABINET MODELS

For over-the-stove cabinet installation

NEW AXIAL FLOW

300 CFM for wall or ceiling

Trade-Wind Motorfans, Inc.

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with important DESIGN LEADERSHIP features . . .

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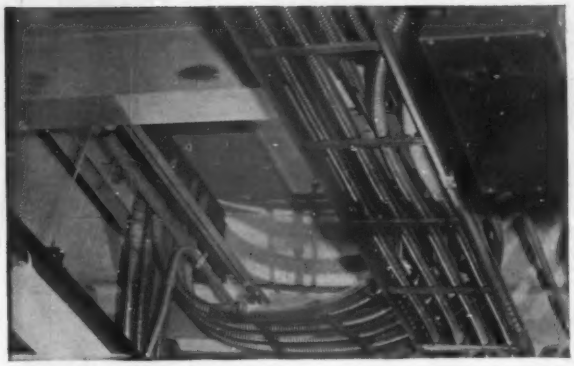
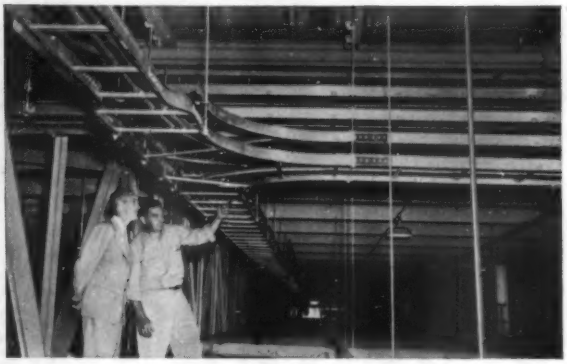
Here's why a General Electric V-c interlocked armor cable system is...

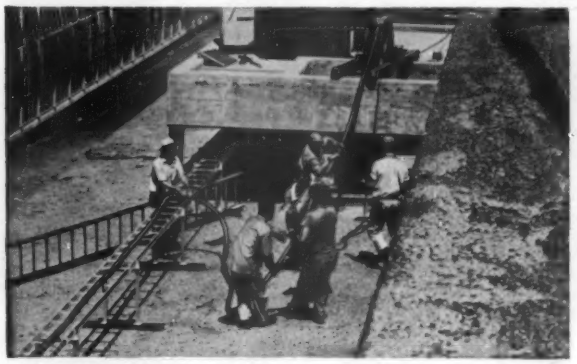
EASY TO INSTALL



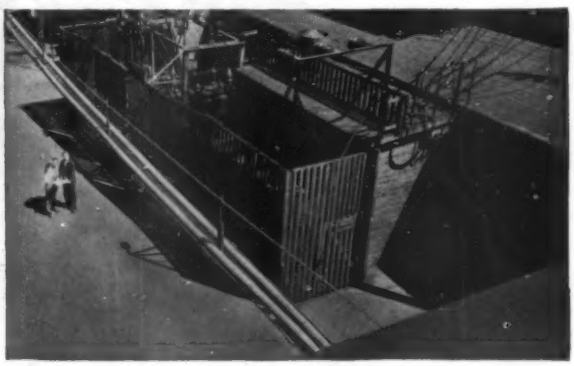
1 CORNERS ARE NO PROBLEM. Flexible V-c interlocked armor cable can be run easily around corners and over beams. This reduces layout and prefitting time—in many instances single line layout diagrams are sufficient. These advantages often cut layout and installation time in half.



2 LONG, UNBROKEN RUNS. You can install V-c interlocked armor cable in long, unbroken runs and thus keep splicing to a minimum. Many cables can be installed on one rack or basket. The small over-all cross section of interlocked armor cable lets you take advantage of cramped areas.



3 LIGHTER WEIGHT. G-E V-c interlocked armor cable weighs only about a third as much as a conventional cable and conduit installation. This light weight means easy handling. Also, the cable can be installed indoors or outdoors without special protection.



4 FEWER CABLES. These two interlocked armor cables take the place of the many low-voltage cables at the right. Fewer cables, plus simple messenger or rack support, give you further reductions in installation time.

5 SPLICING AND TERMINATION ARE EASY. Splicing is a simple mechanical job—easily done by electricians on the site. High-voltage cables can be terminated indoors with a junction box—without potheads. And a G-E V-c interlocked armor cable system is always accessible for alterations or additions.

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